Service Manual

CLP 3516

VERSION 15-07-03

Triumph-Adler

Service Manual

CLP 4516

VERSION 15-07-03

Safety precautions

This booklet provides safety warnings and precautions for our service personnel to ensure the safety of their customers, their machines as well as themselves during maintenance activities. Service personnel are advised to read this booklet carefully to familiarize themselves with the warnings and precautions described here before engaging in maintenance activities.

Safety warnings and precautions

Various symbols are used to protect our service personnel and customers from physical danger and to prevent damage to their property. These symbols are described below:

⚠**DANGER**: High risk of serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**WARNING**:Serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

⚠**CAUTION**: Bodily injury or damage to property may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

Symbols

The triangle (△) symbol indicates a warning including danger and caution. The specific point of attention is shown inside the symbol.

General warning.

Warning of risk of electric shock.

Warning of high temperature.

⃠ indicates a prohibited action. The specific prohibition is shown inside the symbol.

General prohibited action.

Disassembly prohibited.

● indicates that action is required. The specific action required is shown inside the symbol.

General action required.

Remove the power plug from the wall outlet.

Always ground the copier.

1. Installation Precautions

⚠ WARNING

- Do not use a power supply with a voltage other than that specified. Avoid multiple connections to one outlet: they may cause fire or electric shock. When using an extension cable, always check that it is adequate for the rated current. .....

- Connect the ground wire to a suitable grounding point. Not grounding the copier may cause fire or electric shock. Connecting the earth wire to an object not approved for the purpose may cause explosion or electric shock. Never connect the ground cable to any of the following: gas pipes, lightning rods, ground cables for telephone lines and water pipes or faucets not approved by the proper authorities. .....

⚠ CAUTION:

- Do not place the copier on an infirm or angled surface: the copier may tip over, causing injury. .....

- Do not install the copier in a humid or dusty place. This may cause fire or electric shock. .....

- Do not install the copier near a radiator, heater, other heat source or near flammable material. This may cause fire. .....

- Allow sufficient space around the copier to allow the ventilation grills to keep the machine as cool as possible. Insufficient ventilation may cause heat buildup and poor copying performance. .....

- Always handle the machine by the correct locations when moving it. .....

- Always use anti-toppling and locking devices on copiers so equipped. Failure to do this may cause the copier to move unexpectedly or topple, leading to injury. .....

- Avoid inhaling toner or developer excessively. Protect the eyes. If toner or developer is accidentally ingested, drink a lot of water to dilute it in the stomach and obtain medical attention immediately. If it gets into the eyes, rinse immediately with copious amounts of water and obtain medical attention. .....

- Advice customers that they must always follow the safety warnings and precautions in the copier's instruction handbook. .....

2. Precautions for Maintenance

⚠WARNING

- Always remove the power plug from the wall outlet before starting machine disassembly. .....

- Always follow the procedures for maintenance described in the service manual and other related brochures. .....

- Under no circumstances attempt to bypass or disable safety features including safety mechanisms and protective circuits. .....

- Always use parts having the correct specifications. .....

- Always use the thermostat or thermal fuse specified in the service manual or other related brochure when replacing them. Using a piece of wire, for example, could lead to fire or other serious accident. .....

- When the service manual or other serious brochure specifies a distance or gap for installation of a part, always use the correct scale and measure carefully. .....

- Always check that the copier is correctly connected to an outlet with a ground connection. .....

- Check that the power cable covering is free of damage. Check that the power plug is dust-free. If it is dirty, clean it to remove the risk of fire or electric shock. .....

- Never attempt to disassemble the optical unit in machines using lasers. Leaking laser light may damage eyesight. .....

- Handle the charger sections with care. They are charged to high potentials and may cause electric shock if handled improperly. .....

⚠CAUTION

- Wear safe clothing. If wearing loose clothing or accessories such as ties, make sure they are safely secured so they will not be caught in rotating sections. .....

- Use utmost caution when working on a powered machine. Keep away from chains and belts. .....

- Handle the fixing section with care to avoid burns as it can be extremely hot. .....

- Check that the fixing unit thermistor, heat and press rollers are clean. Dirt on them can cause abnormally high temperatures. .....

- Do not remove the ozone filter, if any, from the copier except for routine replacement. .....

• Do not pull on the AC power cord or connector wires on high-voltage components when removing them; always hold the plug itself. .....

• Do not route the power cable where it may be stood on or trapped. If necessary, protect it with a cable cover or other appropriate item. .....

• Treat the ends of the wire carefully when installing a new charger wire to avoid electric leaks. .....

• Remove toner completely from electronic components. .....

• Run wire harnesses carefully so that wires will not be trapped or damaged. .....

• After maintenance, always check that all the parts, screws, connectors and wires that were removed, have been refitted correctly. Special attention should be paid to any forgotten connector, trapped wire and missing screws. .....

• Check that all the caution labels that should be present on the machine according to the instruction handbook are clean and not peeling. Replace with new ones if necessary. .....

• Handle greases and solvents with care by following the instructions below: .....
  · Use only a small amount of solvent at a time, being careful not to spill. Wipe spills off completely.
  · Ventilate the room well while using grease or solvents.
  · Allow applied solvents to evaporate completely before refitting the covers or turning the main switch on.
  · Always wash hands afterwards.

• Never dispose of toner or toner bottles in fire. Toner may cause sparks when exposed directly to fire in a furnace, etc. .....

• Should smoke be seen coming from the copier, remove the power plug from the wall outlet immediately. .....

3. Miscellaneous

⚠WARNING

• Never attempt to heat the drum or expose it to any organic solvents such as alcohol, other than the specified refiner; it may generate toxic gas. .....

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1-1-1 Specifications

Type ..... Desktop
Printing system ..... Electrophotographic printing (tandem)
Paper type..... Cassette: Plain paper (60 to 90 g/m²)
Recycled paper (60 to 90 g/m²)
Thick paper (90 to 105 g/m²)
MP tray: Plain paper (60 to 90 g/m²)
Recycled paper (60 to 90 g/m²)
Thick paper (90 to 200 g/m²)
Special paper: Transparencies, labels, envelopes, postcards, tracing paper
Paper sizes ..... A4 (210 × 297 mm)
B5 (182 × 257 mm)
A5 (148 × 210 mm)
Letter ($8^1/_2$" × 11")
Legal ($8^1/_2$" × 14")
Non-standard size (148 to 216 mm × 210 to 356 mm: cassette), (70 to 216 mm × 148 to 297 mm: MP tray)
Print speeds..... Cassette (Values within [ ] are for duplex printing using the duplexer DU-300.)
A4: 16 pages/minutes [16 pages/minutes]
B5: 17 pages/minutes [16 pages/minutes]
A5: 17 pages/minutes [16 pages/minutes]
Letter-R: 17 pages/minutes [16 pages/minutes]
Legal: 14 pages/minutes [14 pages/minutes]
MP tray (in cassette mode)
A4: 16 pages/minutes [16 pages/minutes]
B5: 17 pages/minutes [16 pages/minutes]
A5: 17 pages/minutes [16 pages/minutes]
Letter: 17 pages/minutes [16 pages/minutes]
Legal: 14 pages/minutes [14 pages/minutes]
First print time ..... Standby mode: 16 seconds or less (A4)
Sleep mode: 76 seconds or less (A4)
Warm-up time ..... Sleep mode: 80 seconds or less (room temperature 23 °C, 60% RH)
Power on: 80 seconds or less (room temperature 23 °C, 60% RH)
Paper feed system ..... One universal cassette and one MP tray
Paper loading capacity..... Cassette: 500 sheets (80 g/m², 0.11 μm)
MP tray: 100 sheets (80 g/m², 0.11 μm)
Paper eject system ..... Face down: 250 sheets (80 g/m², 0.11 μm), equipped with a face-down paper full sensor
Face up: 250 sheets, Optional face-up tray PT-300 must be installed (100 sheets when the duplexer DU-300 is installed
Photoconductor..... OPC drum (diameter 30 mm)
Charging system..... Scorotron (positive charging)
Light source ..... LED
Developing system..... Touch down development method
Developer: Two-component magnetic toner
Toner replenishing: Automatic from the toner container
Transfer system..... Primary transfer: Transfer belt (negative-charged)
Secondary transfer: Transfer roller (negative-charged)
Separation system ..... Small radius curvature separation
Fixing system..... Heat roller system (Oil-less)
Heat roller (diameter 35mm, 500 W halogen heater lamp)
Pressure roller (diameter 35mm, 350 W halogen heater lamp)
Charge erasing system..... Exposure by eraser lamp (LED)
Cleaning system ..... Drum: Counter blade
Primary transfer belt: Fur brush
Controller hardware ..... CPU: Power PC750CXe (400 MHz)
System ROM: 4 MB (32 Mbit × 2)
Font ROM: 4 MB (32 Mbit × 1)
Main RAM: 96 MB standard (on-board); expanding up to 608 MB (standard 96 MB + 256 MB × 2) at the maximum by adding optional expansion memory
Optional expansion RAM (DIMM): 2 slot
100-pin DIMM (32, 64, 128 or 256 MB)

Interface	Parallel: High-speed (bi-directional), IEEE 1284 Nibble/ECP mode USB: Full-Speed USB2.0 Optional interface (KUIO-LV) × 1: Network interface card IB-20 (10 Base-TX/100 Base-TX/10 Base-2), IB-21E (10 Base-TX/100 Base-TX), wireless LAN card IB-22 must be installed.
Controller software	a) Emulation PCL6 (PCL5e+PCLXL) KPDL3 (PostScript 3 compatible) b) Fonts: Bitmap font: 1 Line Printer bitmap font Outline fonts: 80 PCL fonts 136 KPDL3 fonts: c) Graphic: (1) Raster graphic: 75, 100, 150, 200*, 300, 600* dpi (*200 dpi is supported when the resolution is 600 dpi.) (2) Vector graphic: Line, Box, Circle, Arc, Fill pattern etc. (3) Bar code: One-dimensional bar code: 45 types Two o-dimensional bar code: 1 type (PDF-417) d) Connectivity plug & play, Windows 95/98/ME/NT4.0/2000/XP SNMP (KM-NET viewer)
Resolution	600 × 600 dpi (multi 4-bit)
Dimensions	Main unit: 385 × 345 × 470 mm/15.16" × 13.58" × 18.5" (W × D × H)
Weight	Main unit: 22 kg/48.6 lbs (not including toner containers)
Power source	220 - 240 V AC, 50/60 Hz (European countries) 120 V AC, 60 Hz (U.S.A./Canada)
Power consumption	Maximum: 991 W (220 - 240 V model), 1037 W (120 V model) Normal operating: 483 W (220 - 240 V model), 491 W (120 V model) Ready: 202 W (220 - 240 V model), 199 W (120 V model) EcoPower: 26 W (220 - 240 V model), 22 W (120 V model)
Current	4.5 A (220 - 240 V model), 9.1 A (120 V model)
Noise	Printing: 53 dB(A) Ready: 39 dB(A)
Options	Expansion memory (32/64/128/256 MB 100-pin DIMM), memory card (CompactFlash), hard disk unit HD-4, network interface card IB-20 (10 BASE-T/100BASE-TX/10BASE-2),network interface card IB-21E (10BASE-T/100BASE-TX), wireless LAN card IB-22 (compatible to IEEE802.11b), serial interface board IB-11, (Maximum: 115 kbps), paper feeder PF-60 (500 sheets [60 to 105 g/m^2] × 1 cassette, A4, A5, B5, legal, letter, custom), duplexer DU-300, face-up output tray PT-300 (250 sheets) envelope feeder EF-60A

1-1-2 Parts names

(1) Overall

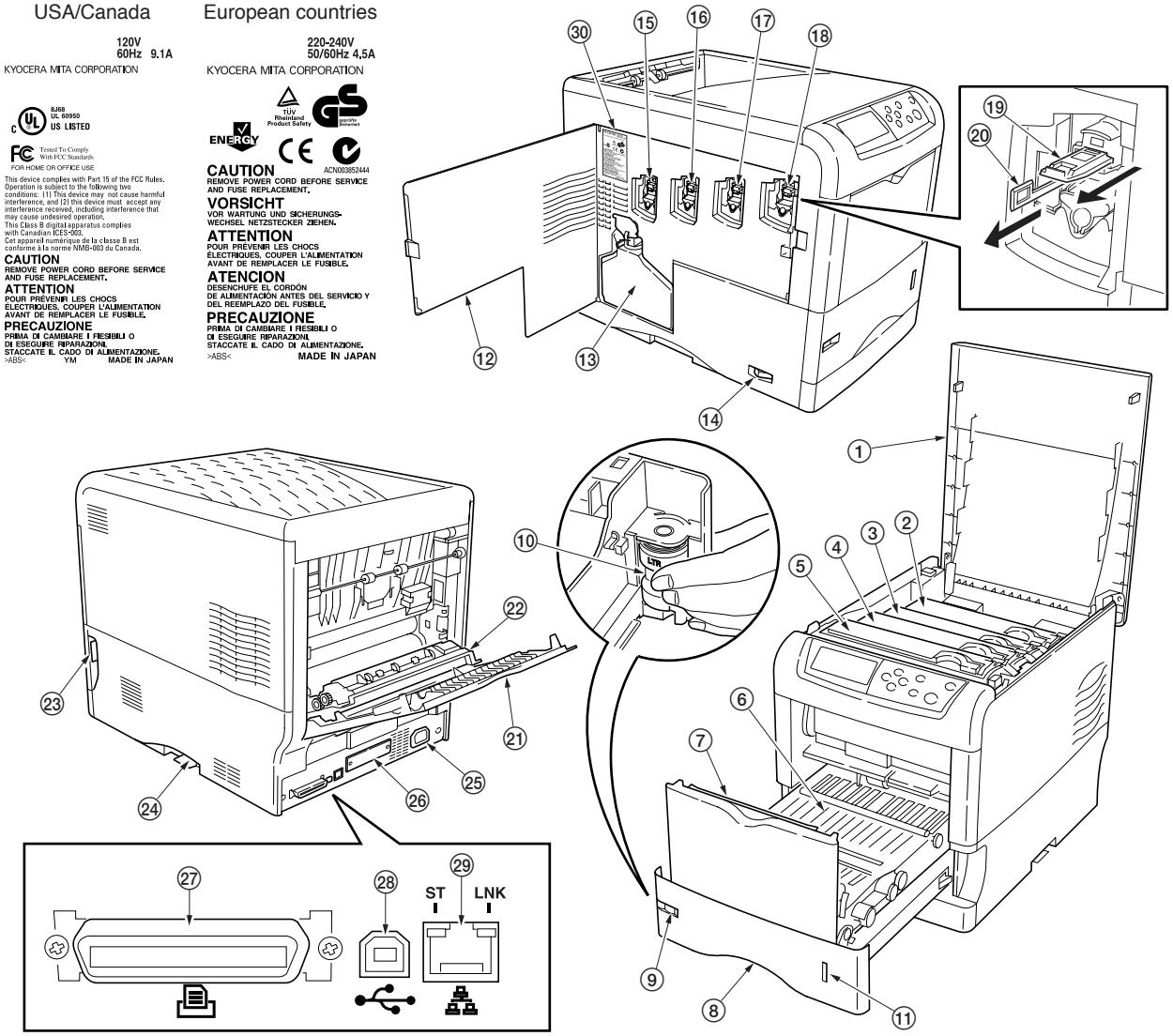

Figure 1-1-1

1. Top cover
2. Magenta toner container
3. Cyan toner container
4. Yellow toner container
5. Black toner container
6. Paper feed unit
7. MP tray
8. Paper cassette
9. Paper size window
10. Paper size dial
11. Paper gauge
12. Left side cover
13. Waste toner box
14. Power switch
15. Magenta main charger unit
16. Cyan main charger unit
17. Yellow main charger unit
18. Black main charger unit
19. Main charger wire cleaner
20. Lens cleaner
21. Rear cover
22. Fuser cover
23. Paper feed unit release lever
24. Memory card slot
25. AC inlet
26. Optional interface slot
27. Parallel interface connector
28. USB interface connector
29. Network interface connector
30. Rating label

(2) Operation panel

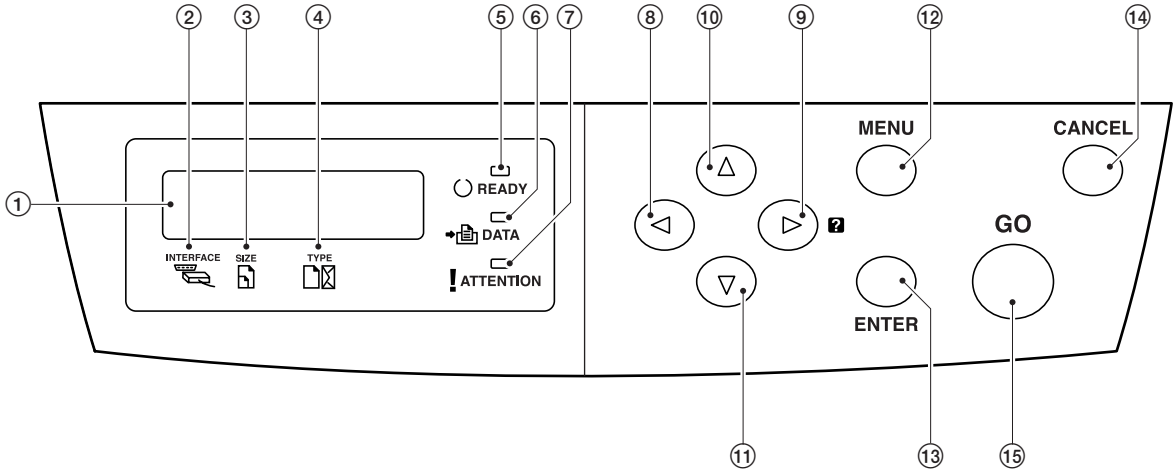

Figure 1-1-2

1. Message display
2. Interface indicator (INTERFACE)
3. Paper size indicator (SIZE)
4. Paper type indicator (TYPE)
5. Ready indicator (READY)
6. Data indicator (DATA)
7. Attention indicator (ATTENTION)
8. ◄ key (Left)
9. ► key (Right)
10. ▲ key (Up)
11. ▼ key (Down)
12. MENU key
13. ENTER key
14. CANCEL key
15. GO key

1-1-3 Cross section view

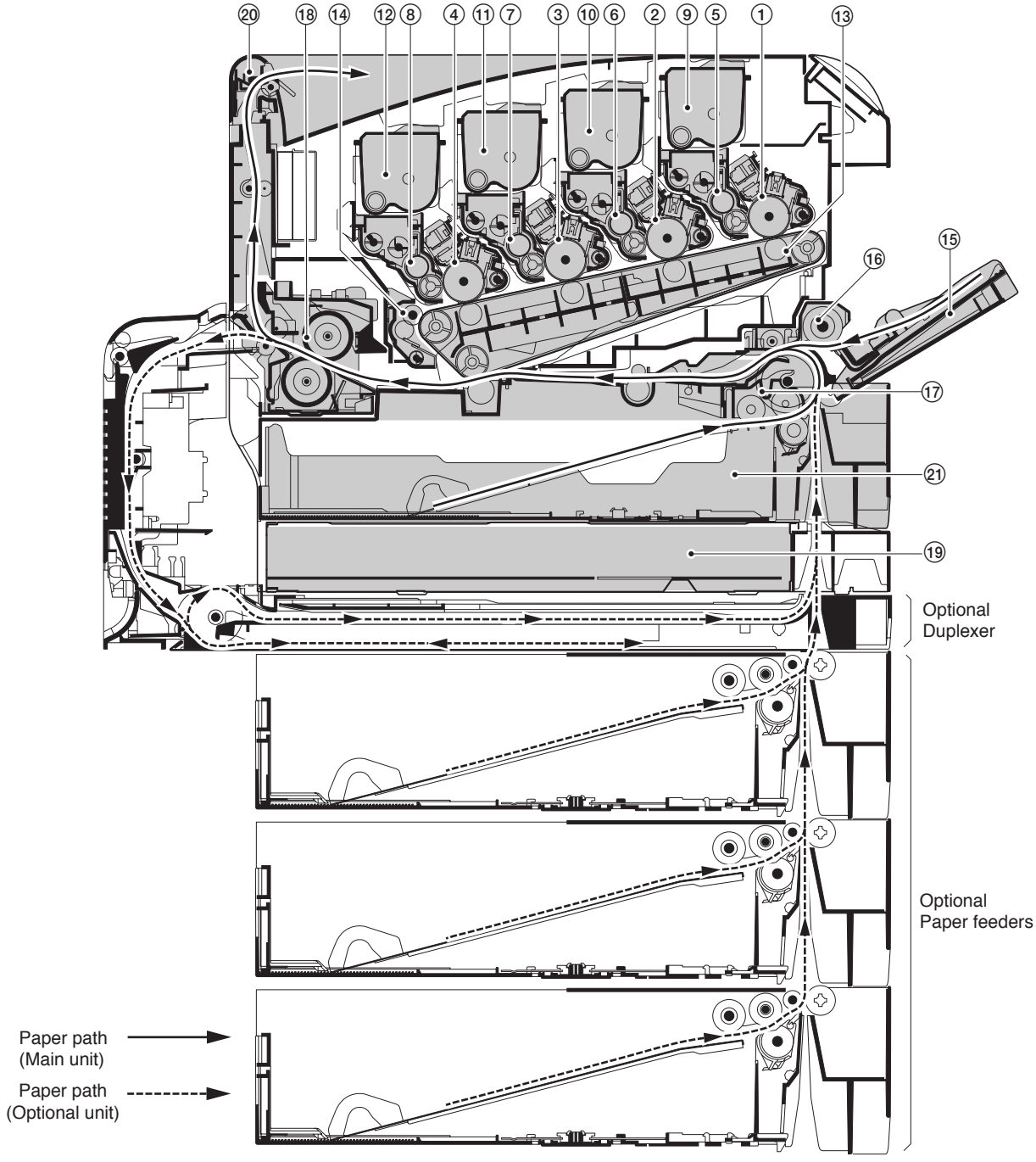

Figure 1-1-3

1. Black drum unit
2. Yellow drum unit
3. Cyan drum unit
4. Magenta drum unit
5. Black developer unit
6. Yellow developer unit
7. Cyan developer unit
8. Magenta developer unit
9. Black toner container
10. Yellow toner container
11. Cyan toner container
12. Magenta toner container
13. Primary transfer unit
14. Primary transfer cleaning unit
15. MP tray
16. MP tray feed unit
17. Feed unit
18. Fuser unit
19. Controller box
20. Face-down tray unit (vertical path)
21. Paper cassette

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1-2-1 Drum unit

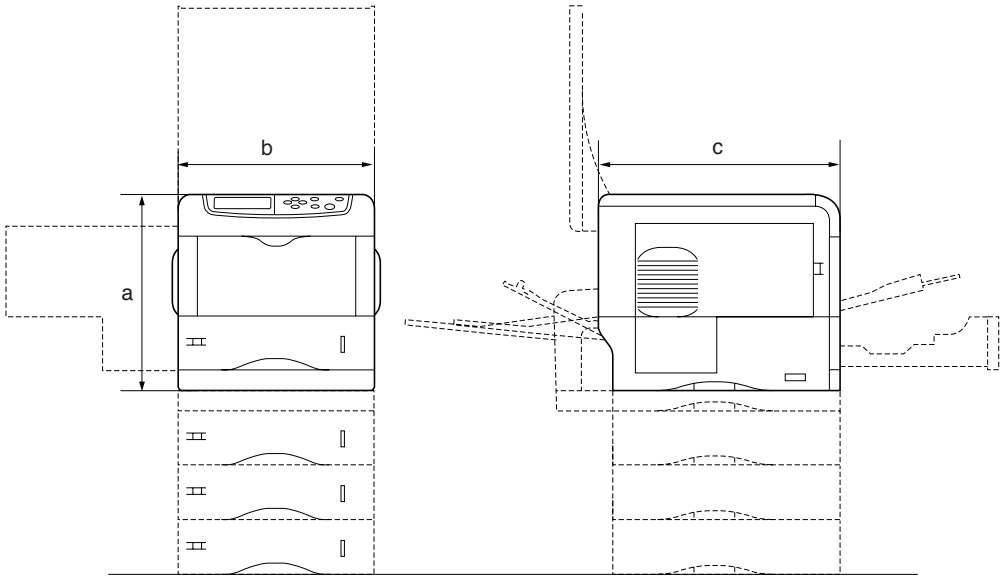
Note the following when handling or storing the drum unit.

- When removing the drum unit, never expose the drum surface to strong direct light.
- Avoid abrupt changes in temperature and humidity.
- Avoid exposure to any substance which is harmful to or may affect the quality of the drum.
- Do not touch the drum surface with any object. Should it be touched by hands or stained with oil, clean it.

Developer unit and toner container
Store the toner container in a cool, dark place.
Avoid direct light and high humidity.

1-2-2 Installation environment

1. Temperature: 10 - 32.5 °C/50 - 90.5 °F
2. Humidity: 20 - 80%RH
3. Power supply: 120 V AC (U.S.A./Canada), 220 - 240 V AC (European countries)
4. Power source frequency: 50 Hz ±2%/60 Hz ±2%
5. installation location
   Avoid direct sunlight or bright lighting. Ensure that the photo-conductor will not be exposed to direct sunlight or other strong light when removing paper jams.
   Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.
   - Avoid dust and vibration.
   - Choose a surface capable of supporting the weight of the machine.
   - Place the machine on a level surface (maximum allowance inclination: 1°).
   - Avoid air-borne substances that may adversely affect the machine or degrade the photo-conductor, such as mercury, acidic of alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.
   - Select a room with good ventilation.
6. Allow sufficient access for proper operation and maintenance of the machine.
   Machine front: 600 mm/26.6"
   Machine rear: 250 mm/9.84"
   Machine right: 250 mm/9.84"
   Machine left: 400 mm/15.7"
   Machine top: 750 mm/29.5"



a: 385mm/15.16"
b: 345mm13.58"
c: 470mm18.5"

Figure 1-2-1 Installation dimensions

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1-3-1 Unpacking and installation

(1) Installation procedure

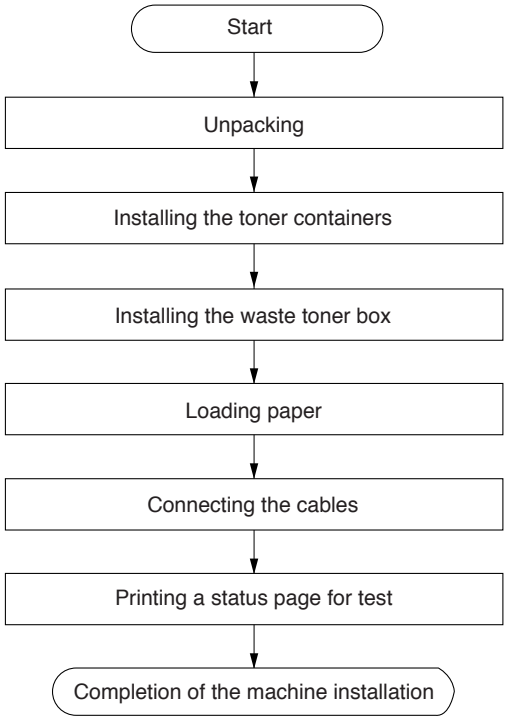


Figure 1-3-1

Unpacking.

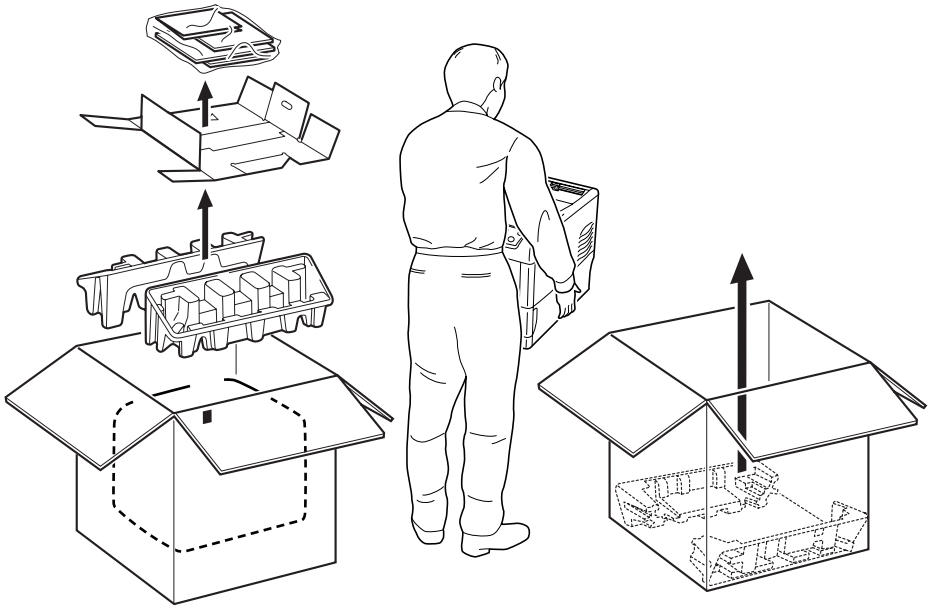


Figure 1-3-2

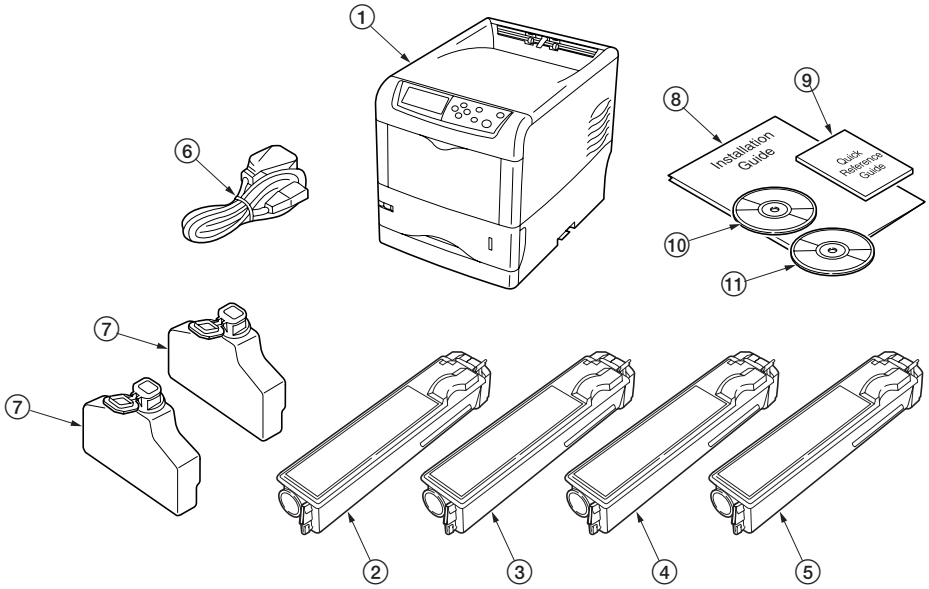


Figure 1-3-3 Unpacking

1. Printer
2. Black toner container
3. Yellow toner container
4. Cyan toner container
5. Magenta toner container
6. Power cord
7. Waste toner box × 2
8. Operation guide
9. Quick reference guide
10. Kyocera mita software library CD-ROM
11. Kyocera mita document library CD-ROM

Installing the toner containers.

1. Remove the protective seal from the black toner container.

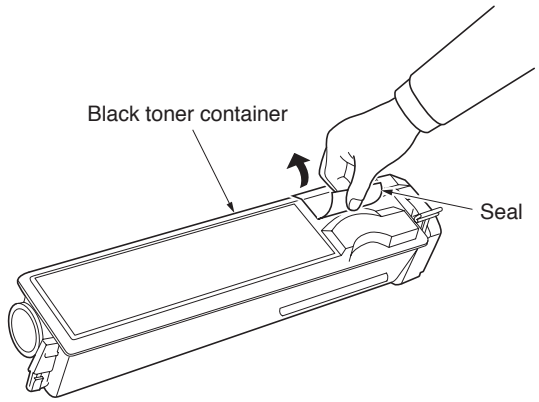


Figure 1-3-4

2. Shake the black toner container several times to loosen the toner inside.

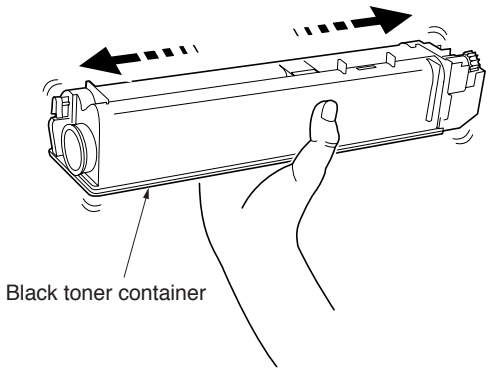


Figure 1-3-5

3. Open the top cover.
4. Install the black toner container into the printer. The black toner container must be installed in the front most developer.

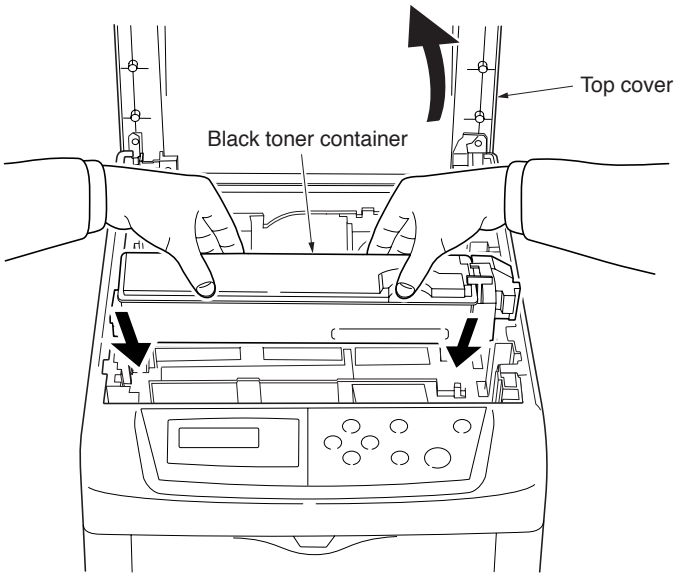


Figure 1-3-6

5. Push in the black toner container firmly until it locks in the developer.

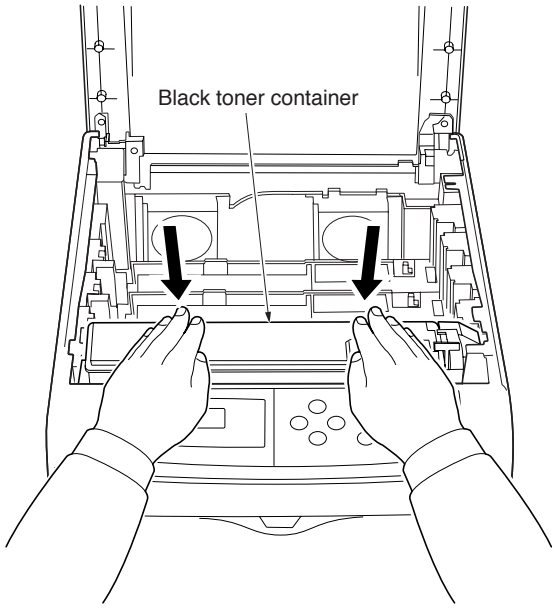


Figure 1-3-7

6. Turn the lock lever backward to the lock position.
7. Install other toner containers in the same procedure.
8. Close the top cover.

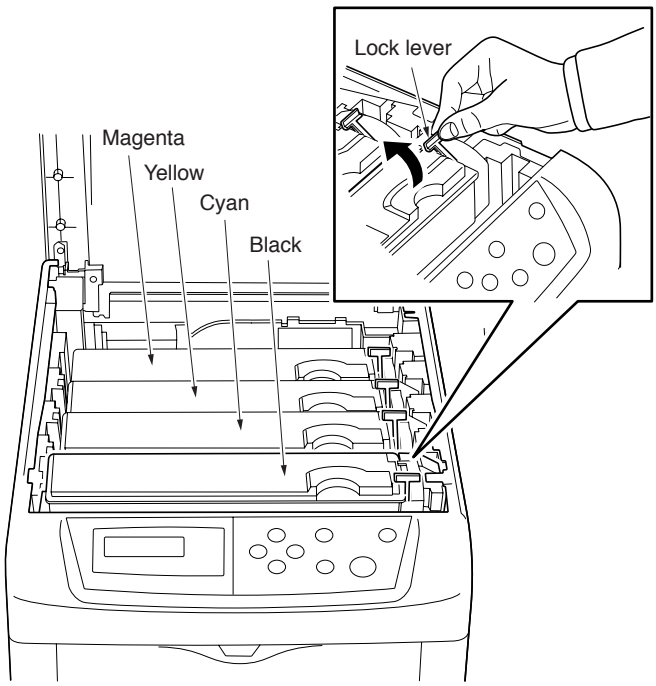


Figure 1-3-8

Installing the waste toner box.

1. Open the side cover.
2. Install the waste toner box.
3. Close the side cover.

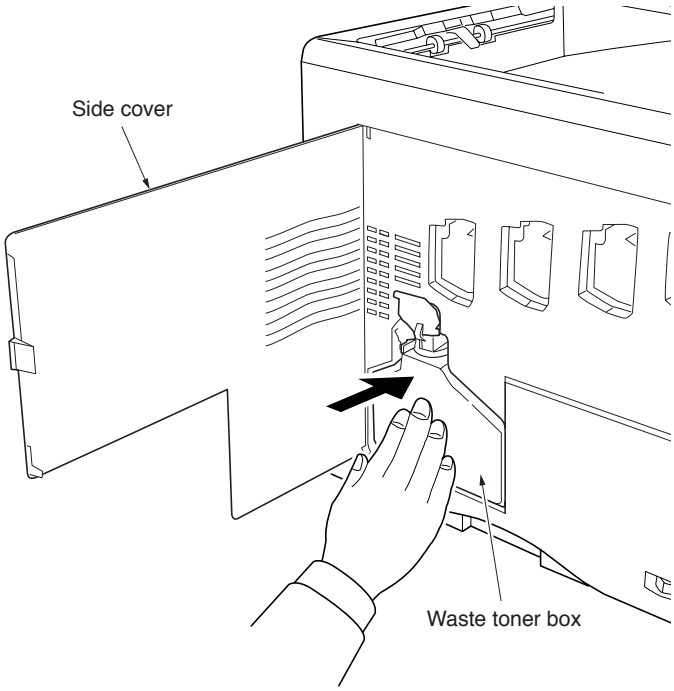


Figure 1-3-9

Loading paper.

1. Remove the cassette from the printer.
2. Adjust the paper guides and the paper stopper according to the paper size to be used.
3. Turn the dial so that the size of the loaded paper is indicated in the paper size indication window.

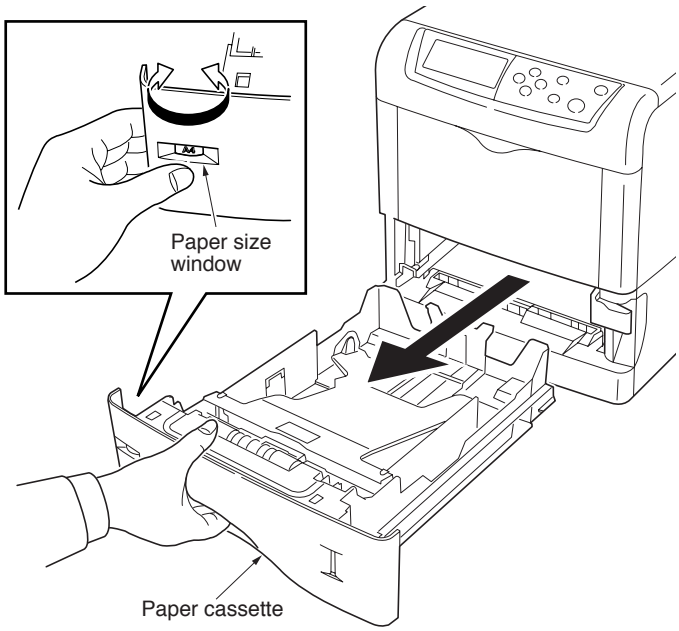


Figure 1-3-10

Connecting the cable.

1. Connect the USB, ethernet, or parallel cable between the printer and the computer.
2. Connect the power cord to the printer AC inlet.
3. Connect the power cord to the wall outlet.

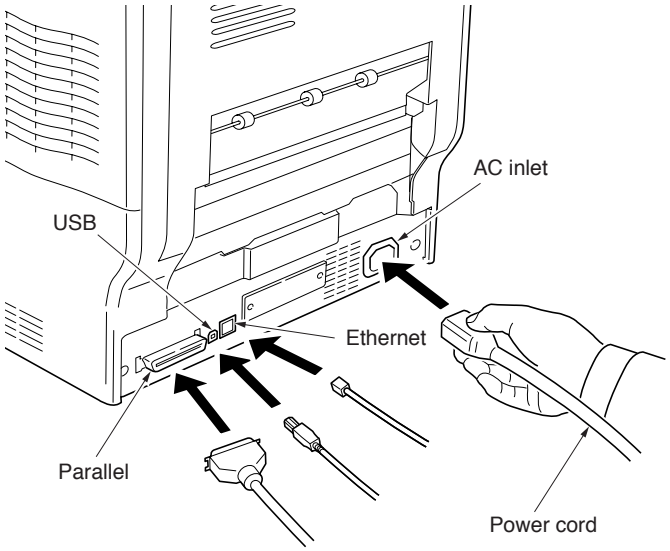


Figure 1-3-11

Printing a status page for test.

1. Turn on the printer power switch. The message will change from [Self test] to [Ready] when initialization is complete.

- Use the following key operation to print a status page for test.
- Press the MENU key when [Ready] is displayed.
- Press the ▼ key to display [Print Status Page].
- Press the ENTER key to display [Print Status Page?].
- Press the ENTER key. Processing] will be displayed and the status page will be printed. When printing is complete, [Ready] will appear again.

2. Check to see if the status page is properly printed.

Completion of the machine installation.

1-3-2 Installing expansion memory (optional)

<Procedure>

1. Turn off printer power.
   * **Caution**: Do not insert or remove expansion memory while printer power is on. Doing so may cause damage to the printer and the expansion memory.
2. If a memory card is currently installed in the memory card slot (See the figure), remove the memory card first.
3. Remove two screws and then remove the main controller PWB.

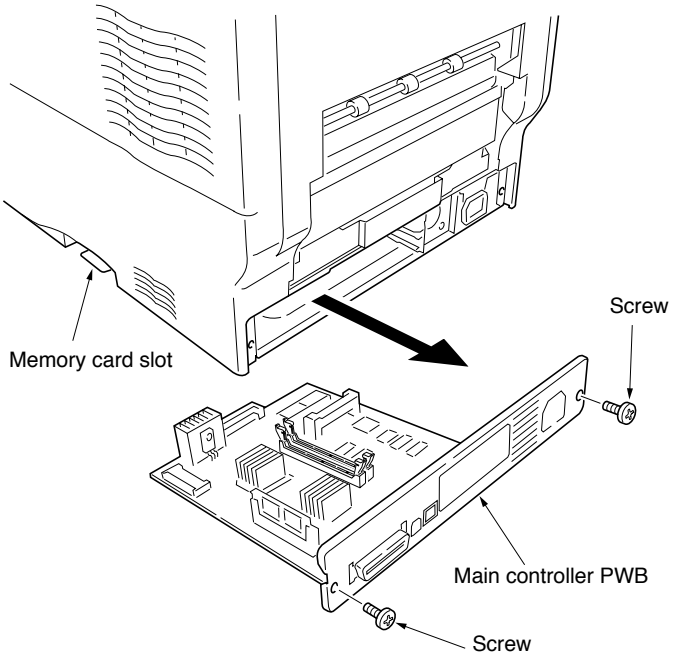


Figure 1-3-12

4. Open the stoppers of the memory socket.
5. Insert the memory so that the two notches of the memory are engaged with the projections of the memory socket.
6. Close the stoppers of the memory socket.
7. Reattach the main controller PWB in the printer.
8. Print a status page to check the memory expansion.
   * If memory expansion has been properly performed, information on the installed memory is printed with the total memory capacity has been increased. Standard memory capacity 96 MB.)

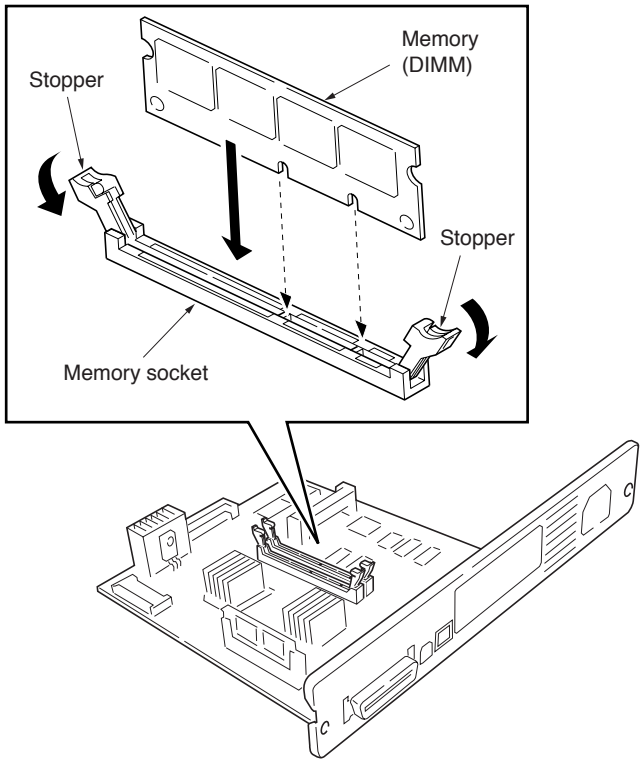


Figure 1-3-13

1-3-3 Installing a memory card (optional)

<Procedure>

1. Turn off printer power.
   * **Caution**: Do not insert or remove memory card while printer power is on. Doing so may cause damage to the printer and the memory card.
2. Insert the memory card into the memory card slot.
3. Format the memory card before use. (Refer to the operation guide.)

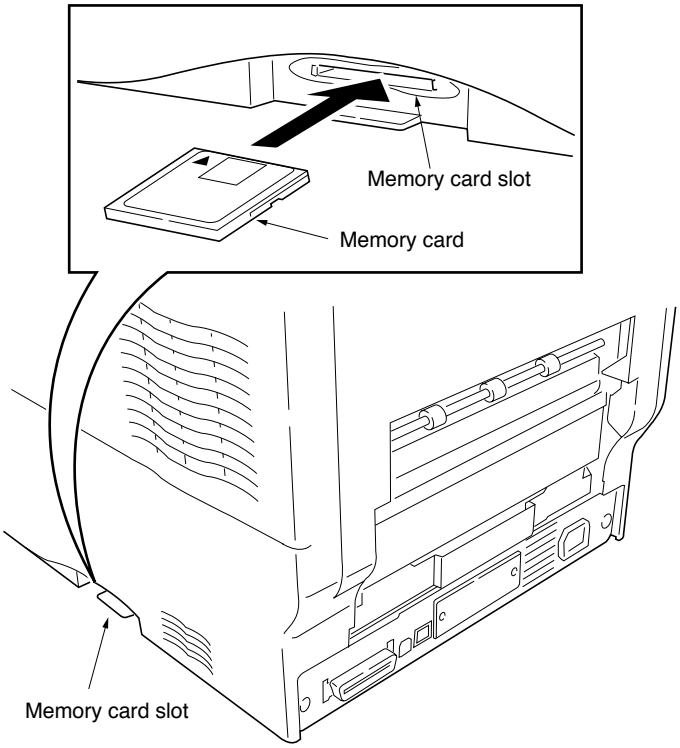
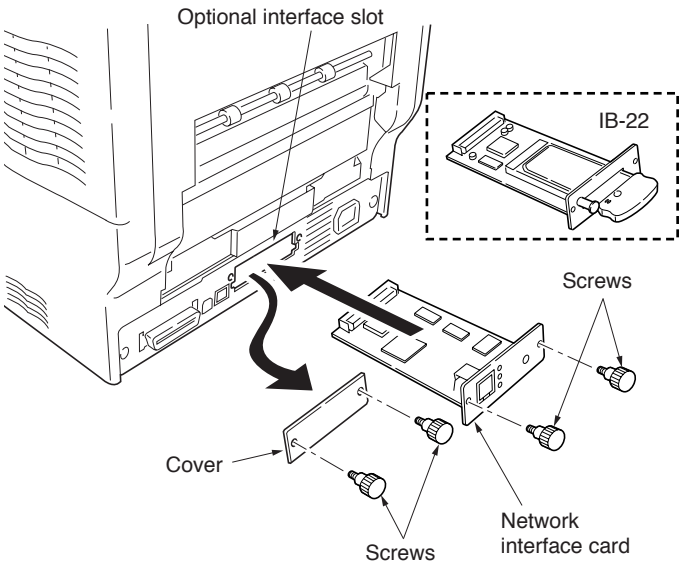


Figure 1-3-14

1-3-4 Installing the network interface card (optional)

<Procedure>

1. Turn off printer power.
2. Remove the two screws and then remove the optional interface slot cover.
3. Insert the network interface card into the optional interface slot.
4. Use the two screws to secure the network interface card.

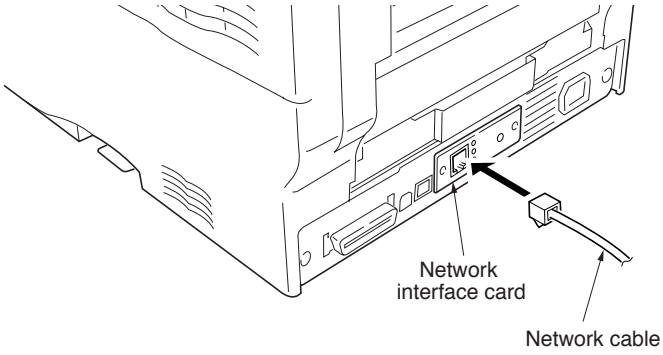


Network interface cards avilable

Part number	Specifications	Remarks
IB-20	10 Base-TX,100 Base-TX,10 Base2	
IB-21E	10 Base-TX,100 Base-TX	
IB-22	Compatible to IEEE 802.11b	Wireless LAN

Figure 1-3-15

5. Connect the network cable (IB-20 and IB-21E).
6. Configure the network interface card. (See the IB-2x quick configuration guide.)



Network configuration (ex. IB-22)

Item	Setting
Wireless LAN Mode	Ad hoc/802.11 Ad hoc/ Infrastruccture/Automatic
SSID	Any string (up to 32 characters)
Channel	Depends on the environment
Encryption (WEP)	DISABLE/64 bit/128 bit
WEP key	Hexadecimal setting (00-FF) 64 bits = 10 digits, 128 bits = 26 digits

Figure 1-3-16

1-3-5 Installing the hard disk unit (optional)

<Procedure>

1. Turn off printer power.
2. Remove the two screws and remove the optional interface slot cover.
3. Insert the hard disk unit into the optional interface slot.
4. Use the two screws to secure the hard disk unit.
5. Format the hard disk unit. (Refer to the operation guide.)

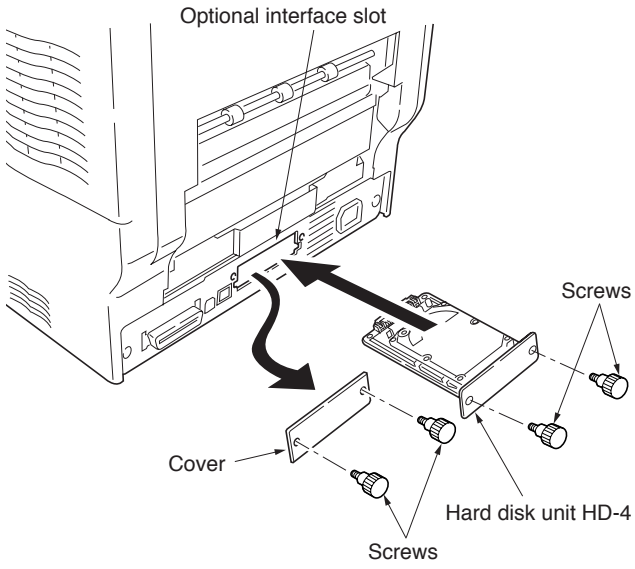
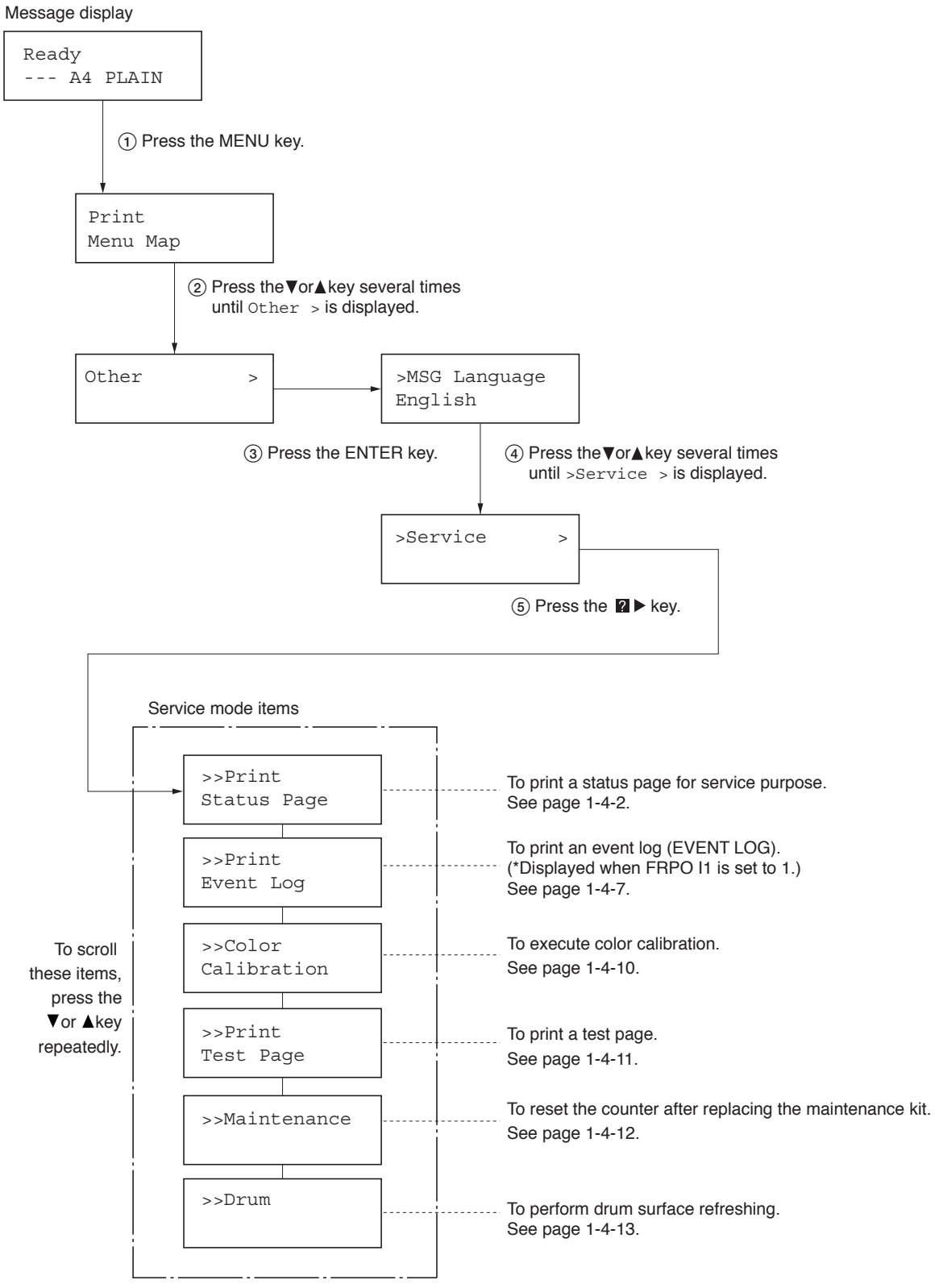


Figure 1-3-17

1-4-1 Service mode

The printer is equipped with various service mode that can be accessed with the MENU key operation on the operation panel.

(1) Executing service mode



Service items	Description
>>Print Status Page	**Printing a status page for service purpose** **Description** Prints a status page for service purpose. The status page includes various printing settings and service cumulatives. **Purpose** To acquire the current printing environmental parameters and cumulative information. **Procedure** 1. Enter the service mode [>>Print Status Page]. 2. Press the ENTER key. “Print Status Page?” will be displayed. 3. Press the ENTER key. Two pages will be printed. (The second page includes service information.)

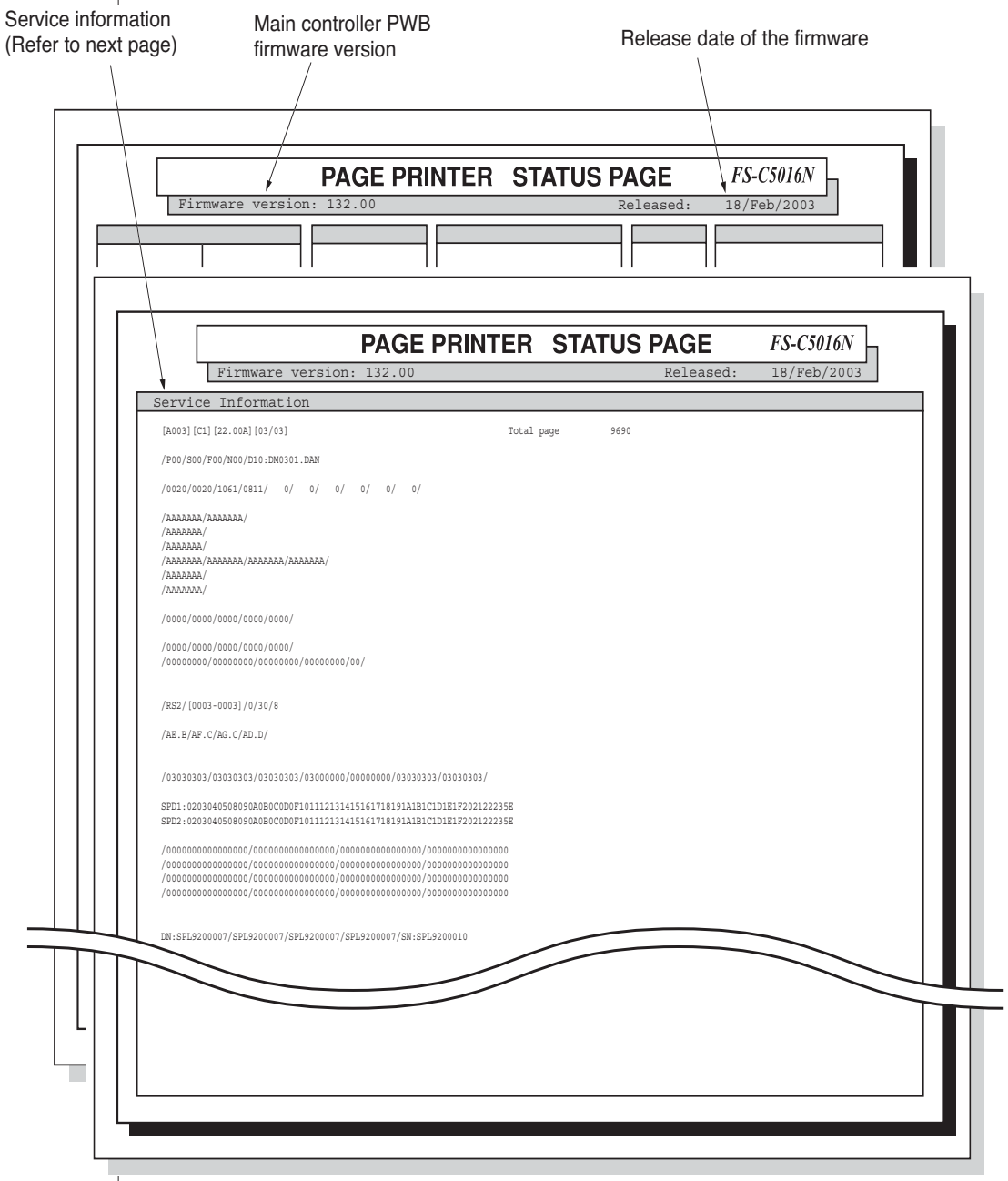


Figure 1-4-1

Service items	Description

Service information

```
[A003] [C1] [22.00A] [03/03]                                   Total page          9690
 ①    ②     ③       ④                                                          ⑤
/P00/S00/F00/N00/D10:DM0301.DAN
 ⑥  ⑦  ⑧  ⑨       ⑩
/0020/0020/1061/0811/   0/   0/   0/   0/   0/   0/
          ⑪                    ⑫
⑬ /AAAAAAA/AAAAAAA/
⑭ /AAAAAAA/
⑮ /AAAAAAA/
⑯ /AAAAAAA/AAAAAAA/AAAAAAA/AAAAAAA/
⑰ /AAAAAAA/
⑱ /AAAAAAA/

⑲ /0000/0000/0000/0000/0000/

⑳ /0000/0000/0000/0000/0000/
  /00000000/00000000/00000000/00000000/00/
                  ㉑                    ㉒

  /RS2/ [0003-0003] /0/30/8
   ㉓      ㉔       ㉕ ㉖ ㉗
㉘ /AE.B/AF.C/AG.C/AD.D/


㉙ /03030303/03030303/03030303/03000000/00000000/03030303/03030303/

㉚ SPD1:0203040508090A0B0C0D0F10111213141516171819 1A1B1C1D1E1F202122235E
㉛ SPD2:0203040508090A0B0C0D0F10111213141516171819 1A1B1C1D1E1F202122235E

㉜ /0000000000000000/0000000000000000/0000000000000000/0000000000000000
  /0000000000000000/0000000000000000/0000000000000000/0000000000000000
  /0000000000000000/0000000000000000/0000000000000000/0000000000000000
  /0000000000000000/0000000000000000/0000000000000000/0000000000000000


  DN:SPL9200007/SPL9200007/SPL9200007/SPL9200007/SN:SPL9200010
                    ㉝                          ㉞
```

Items	Description
① Engine ROM information	[Flash ROM version]
② Operation panel PWB information	[Operation panel PWB mask ROM version]
③ Boot ROM information	[Boot ROM version]
④ Software jumper switch information (hexadecimal)	[First byte/second byte (displayed in OEM mode only)] First byte Bit 0 = 1: (Fixed) Bit 1 = 0: Overseas, 1: Domestic (Japan) Bit 2, 3 (Not used) Bit 4 = 0: Kyocera, 1: OEM Bit 5 = 0: For Europe, 1: For US Bit 6 = 0: Non MICR mode, 1: MICR mode Bit 7 = 0: Kyocera, 1: Kyocera Mita Second byte: Displayed in OEM mode only

Service items	Description

Items	Description
⑤ Total page	Total print page count
⑥ Parallel I/O information	
⑦ Serial I/O error code	00: Normal Bit 0: Framing error Bit 1: Overrun error Bit 2: Parity error
⑧ Operation panel lock status (displayed only when locked)	01: Partial lock 02: Full lock
⑨ NVRAM error (displayed only when any error has occurred)	01: ID error 02: Version error 03: Checksum error 04: NVRAM crash error
⑩ NVRAM downloading status	00: Normal (not downloaded) Bit 0: Font data Bit 1: Host data Bit 2: Macro data Bit 3: Program data Bit 4: Operation panel message data (file name displayed) Bit 5: OEM data (file name displayed) Bit 6: Reserved Bit 7: Error occurred
⑪ Printable area setting	/Top offset/Left offset/Page length/Page width
⑫ Left offset for each paper source	/MP tray/Cassette 1/Cassette 2/Cassette 3/Cassette 4/Cassette 5/Duplexer
⑬ Optional paper feeder life counter	/Paper feeder 1/Paper feeder 2
⑭ Optional paper feeder life counter	/Paper feeder 3
⑮ Optional paper eject unit life counter	/ Duplexer/
⑯ Drum life counter	/Cyan drum unit/Magenta drum unit/Yellow drum unit/Black drum unit
⑰ Pixel counter	/Cyan/Magenta/Yellow/Black
⑱ Maintenance kit counter	
⑲ Optional unit software version	/Paper feeder1/Paper feeder 2/Paper feeder 3/Envelope feeder/Duplexer
⑳ Drum ID	/Cyan/Magenta/Yellow/Black
㉑ LED print head compensation value	
㉒ LED print head compensation data handling error	0: Normal bit0 to 3: LED print head compensation data in the LED print head memory PWB (0: Black, 1: Yellow, 2: Cyan, 3: Magenta) bit4: Consistency and legitimacy check bit5: Type of system DIMM PWB bit6: Erasing to the system DIMM PWB bit7: Writing to the system DIMM PWB bit8: Checking the blank after erasing to the system DIMM PWB bit9: Verifying after writing to the system DIMM PWB

Service items	Description

Items	Description
㉓ Serial interface information	RS2: RS-232C RS4: RS-422A
㉔ Optional unit information	Upper 2 bytes Bit 0: MPF Bits 1 to 6: Feeders 1 to 6 (6 is not supported) Bit 7: Duplexer Bit 9: Envelope feeder Bits 10 to 15: Reserved Lower 2 bytes Bit 0: Face-up Bit 1: Face-down Bits 2 to 15: Reserved
㉕ Operation panel message language	PMSG command setting (decimal)
㉖ Current temperature	0 to 60 °C (in 1 °C increment, "-"= Humidity/temperature sensor is abnormal.)
㉗ Current humidity	10 to 90% RH (in 2% increment)
㉘ Average printing ratio (2 digits for integer part, 1 digit for decimal part)	/Cyan/Magenta/Yellow/Black Printing ratio for the total period from shipping (displayed in%)
㉙ Media type attributes	Media type setting value from 1 to 28 (fixing temperature, paper thickness, duplex printing, refer to next page) (14 to 20 are unused and always 0x00.)
㉚ Memory SPD information (slot 1)	Bus error if all digits are "E".
㉛ Memory SPD information (slot 2)	Bus error if all digits are "E".
㉜ Engine parameter setting	Hexadecimal, 128 bytes (256 digits)
㉝ Drum serial number	/Cyan/Magenta/Yellow/Black
㉞ Machine serial number	-

NOTE:

Code conversion

A	B	C	D	E	F	G	H	I	J
0	1	2	3	4	5	6	7	8	9

Service items	Description

Table 1-4-1 Media type attribute

No.	Type	Yes/ No	Type adjust default	Paper feed source			Paper destination		
				Paper cassette	MP tray	Enve-lope feeder	Duplexer	Face-down tray	Face-up tray
1	Plain	YES	Normal2	YES	YES	YES	YES	YES	YES
2	Transparency	YES	Extra.Thick	NO	YES	NO	NO	YES	YES
3	Preprinted	YES	Normal2	YES	YES	YES	YES	YES	YES
4	Labels	YES	Thick1	NO	YES	YES	NO	YES	YES
5	Bond	YES	Normal2	YES	YES	YES	YES	YES	YES
6	Recycled	YES	Normal2	YES	YES	YES	YES	YES	YES
7	Vellum	YES	Thin	NO	YES	NO	NO	YES	YES
8	Rough	YES	Normal2	YES	YES	YES	YES	YES	YES
9	Letter Head	YES	Normal2	YES	YES	YES	YES	YES	YES
10	Color	YES	Normal2	YES	YES	YES	YES	YES	YES
11	Prepunched	YES	Normal2	YES	YES	YES	YES	YES	YES
12	Envelope	YES	Thick1	NO	YES	YES	NO	YES	YES
13	Cardstock	YES	Thick2	NO	YES	YES	NO	YES	YES
14	Coated	YES	Normal2	NO	YES	YES	NO	YES	YES
15	2'nd Side	NO	-	-	-	-	-	-	-
16	Thick	YES	Thick1	NO	YES	YES	NO	NO	YES
17	Fine	YES	Normal2	YES	YES	YES	YES	YES	YES
18	Reserved	-	-	-	-	-	-	-	-
19	Reserved	-	-	-	-	-	-	-	-
20	Reserved	-	-	-	-	-	-	-	-
21	Custom1	YES	Normal2	YES	YES	YES	YES	YES	YES
22	Custom2	YES	Normal2	YES	YES	YES	YES	YES	YES
23	Custom3	YES	Normal2	YES	YES	YES	YES	YES	YES
24	Custom4	YES	Normal2	YES	YES	YES	YES	YES	YES
25	Custom5	YES	Normal2	YES	YES	YES	YES	YES	YES
26	Custom6	YES	Normal2	YES	YES	YES	YES	YES	YES
27	Custom7	YES	Normal2	YES	YES	YES	YES	YES	YES
28	Custom8	YES	Normal2	YES	YES	YES	YES	YES	YES

Table 1-4-2 Type adjust setting

No.	Type	Speed (line)			Speed in gloss mode		
		1	3/4	1/2	1	3/4	1/2
1	Thin	YES	-	-	-	YES	-
2	Normal1	YES	-	-	-	YES	-
3	Normal2	YES	-	-	-	YES	-
4	Normal3	YES	-	-	-	YES	-
5	Thick1	-	YES	-	-	-	YES
6	Thick2	-	-	YES	-	-	-
7	Thick3	-	-	YES	-	-	-
8	Extra Thick	-	-	YES	-	-	-

Note that a half speed is 55 % of the normal speed. Since the speed of printing in gross mode gets slower than normal, printing in media types including Thick2, Thick3, and Extra Thick is not possible in gloss mode.

Service items	Description
>>Print Event Log	**Printing an event log (EVENT LOG)** **Description** Prints the history of paper misfeeds and self-diagnostic errors including up to 16 items from the latest occurrence of such an error. (If the number of errors exceeds 16, errors will be deleted sequentially from the oldest one.) **Purpose** To allow machine malfunction analysis based on the frequency of paper misfeeds and self-diagnostic errors. **Procedure** 1. Enter the service mode [>>Print Event log]. 2. 2. Press the ENTER key. ">>Print Event Log?" will be displayed. 3. 3. Press the ENTER key. A sheet of event log will be printed.

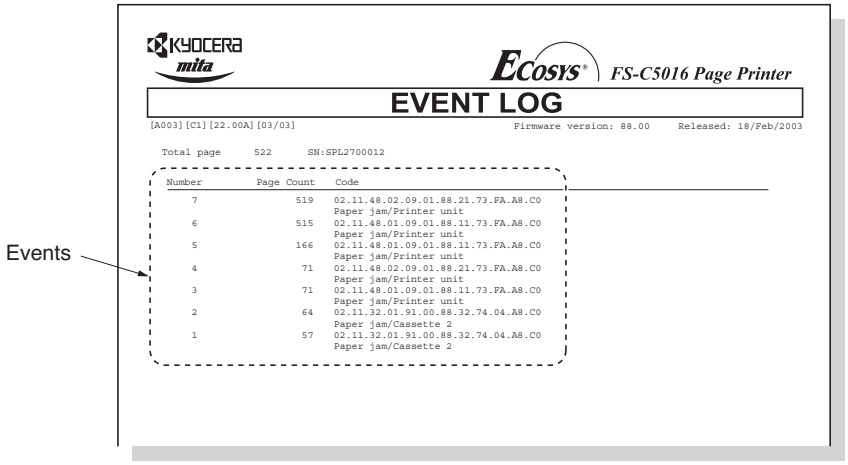


Figure 1-4-3 Event log (EVENT LOG)

Details of events

The event list includes the following information:

Ⓐ Number: Prints a list of errors occurred (1 to 16). A smaller number means an older event.
Ⓑ Number of pages: Number of pages printed when an error occurred
Ⓒ Description: Indicates the description of error.
Ⓓ Code: Code ① identifies an error and codes ② to ⑨ indicate the details.
The value 02 of code ① means a paper misfeed. See code table (1).
The value 99 of code ① means a self-diagnostic error. See code table (2).

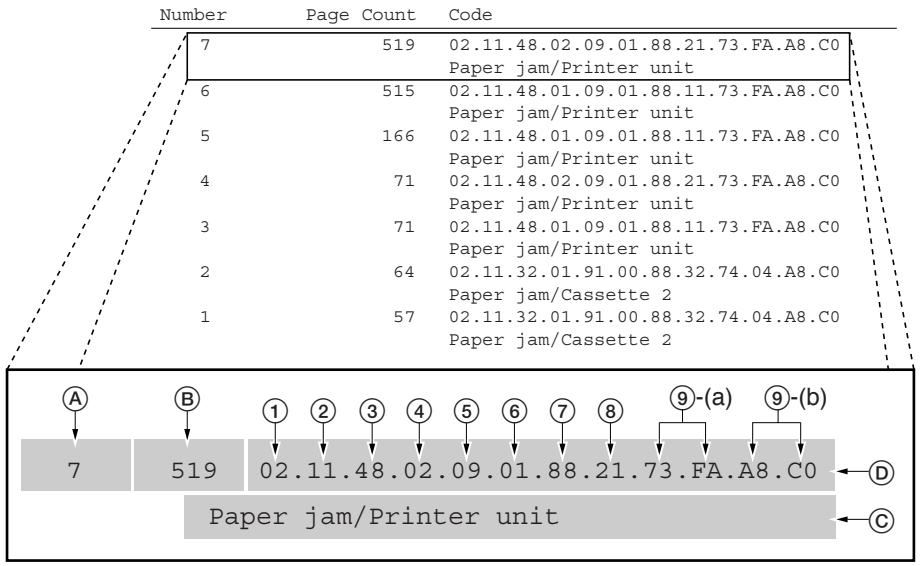
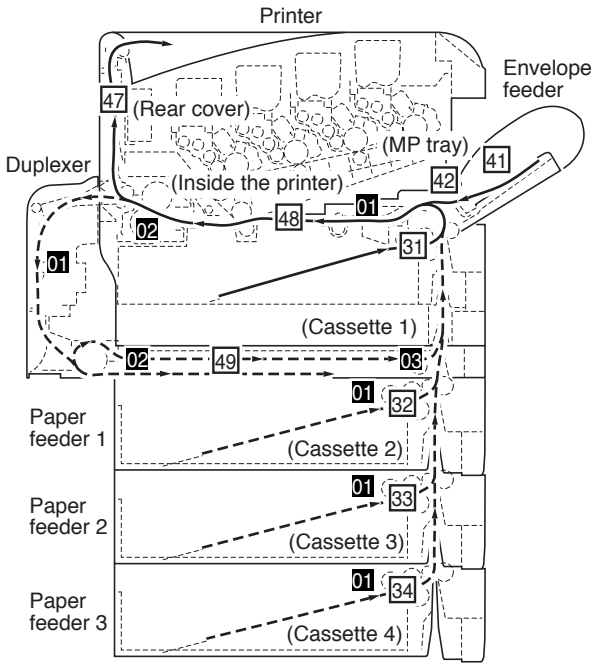


Figure 1-4-4 Understanding events

Service items	Description

Table 1-4-3 Code table (1)

Code digit and Details of code description		Code table	
①	Identification code	02: Paper misfeed	
②	Error type (hexadecimal)	11: Paper misfeed	
③	Paper mis feed location ASCII)	31: Cassette 1 (in the printer) 32: Cassette 2 33: Cassette 3 34: Cassette 4 35: Envelope feeder 42: MP tray 47: Rear cover 48: Inside the printer 49: Duplexer	
④	Paper misfeed location (hexadecimal)	01: Paper feed sensor [32] Paper feed sensor [33] Paper feed sensor [34] Registration sensor [48] Vertical path sensor [49] 02: Eject sensor [47] Switchback sensor [47] 03: Duplexer refeed sensor [49] 99:Not determined Values within [ ] indicate paper misfeed locations.	
⑤	Cause of paper misfeed (hexadecimal)	01: Paper did not pass within a specified time. 02: Paper did not arrive within a specified time. 09: Paper remains longer than a specified time. (other than 01 and 02) 11: Paper misfeed occurred when paper is being transported. 91: Paper remains when power is turned on. 99: Others (Paper stopped due to an external cause such as opening of a cover during-printing.)	
⑥	Paper source (hexadecimal)	00: MP tray 01: Cassette 1 (in the printer) 02: Cassette 2 03: Cassette 3 04: Cassette 4 09: Duplexer 99: Envelope feeder	
⑦	Paper size (hexadecimal)	01: Monarch 02: Business 03: International DL 04: International D5 05: Executive 06: Letter size 07: Legal size	08: A4 09: B5 13: A5 14: A6 15: B6 16: Commercial #9 17: Commercial #6	18: ISO B5 19: Custom size 31: Postcard 32: Reply-paid 33: Oficio II 34: 216 × 310 (mm) 35: 216 × 305 (mm)

Service items	Description

Code digit and Details of code description		Details of code
⑧	Main cause of paper misfeed (hexadecimal)	10: Paper does not arrive at the registration sensor. 11: Paper does not pass the registration sensor. 12: Paper remains at the registration sensor when power is turned on. 20: Paper does not arrive at the eject sensor. 21: Paper does not pass the eject sensor. 22: Paper remains at the eject sensor when power is turned on. 30: Paper does not arrive at the paper feeder 1 feed sensor. 31: Paper does not pass the paper feeder 1 feed sensor. 32: Paper remains at the paper feeder 1 feed sensor when power is turned on. 40: Paper does not arrive at the paper feeder 2 feed sensor. 41: Paper does not pass the paper feeder 2 feed sensor. 42: Paper remains at the paper feeder 2 feed sensor when power is turned on. 50: Paper does not arrive at the paper feeder 3 feed sensor. 51: Paper does not pass the paper feeder 3 feed sensor. 52: Paper remains at the paper feeder 3 feed sensor when power is turned on. A1: Paper does not arrive at the vertical path sensor. A2: Paper does not arrive at the switchback sensor. A3: Paper does not pass the vertical path sensor. A4: Paper does not arrive at the duplexer refeed sensor. A5: Paper does not pass the switchback sensor. A6: Paper does not pass the duplexer refeed sensor. A7: Duplexer overflow (Third sheet is commanded when second sheet remains.) A8: Duplexer drive signal output from the printer while paper is transported turns off. A9: Paper remains in the duplexer when power is turned on. E0: Paper misfeed occurs due to forced stop when an error occurs during printing. (such as opening of a cover) F0 to FF: Paper misfeed caused by a reason excluding above.
⑨	(a) Misfed paper width (hexadecimal)	0000 to FFFF [in 0.1 mm] Example: 73FA (hexadecimal) = 29690 (decimal) = 296.9 mm
	(b) Misfed paper length (hexadecimal)	0000 to FFFF: [in 0.1 mm] Example: A8C0 (hexadecimal) = 43200 (decimal) = 432.0 mm

Service items	Description

Table 1-4-4 Code table (2)

Code digit and Details of code description		Details of code	
1	Identification code (hexadecimal)	99: Self-diagnostic error	
2	Self-diagnostic error code [Upper digit of former 2 digits] (hexadecimal)	10: A 11: B 12: C 13: D 14: E	
3	Self-diagnostic error code [Lower digit of former 2 digits] (hexadecimal)	00: 0 01: 1 02: 2 03: 3 04: 4 05: 5 06: 6 07: 7	08: 8 09: 9 10: A 11: B 12: C 13: D 14: E 15: F
④ to ⑧		Unused	
Remarks: Self-diagnostic error codes E0 and F0 to F2 are not recorded.			

`>>Color Calibration`

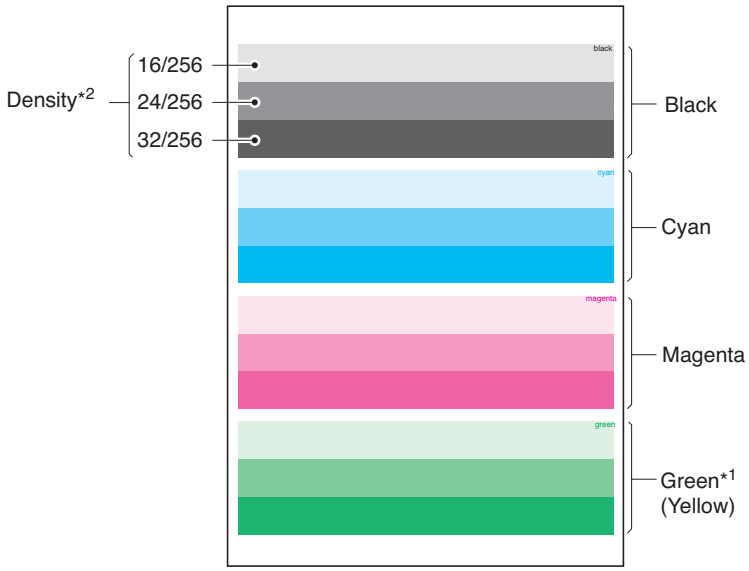
Execution of color calibration

Description
Executing the density of color using.

Purpose
To carry out color calibration manually besides it can be carried out automatically each time the printer is turned on.

Start
Enter the service mode [>>Color Calibration].
Press the ENTER key twice. The color calibration starts and automatically finishes.
Completion

Service items	Description
>>Print Test Page	**Printing a test page** **Description** Four colors are printed respectively with halftones of three different levels. Purpose To check the activation of the developer and drum units of four colors. **Start** Enter the service mode [>>Printing Test Page]. Press the ENTER key twice. The test page is printed. **Completion**



*1: Since focusing in yellow is hardly readable, yellow is mixed with cyan for more readability, resulting in green.
*2: Each portion of colors has three different magnitude of halftones (bands). If focus is excessively lost, dots are not recognizable with the 16/256 band, resulting in uneven density. It also results in vertical streaks in the 24/256 and/or 32/256 bands.

Figure 1-4-5 Test page

Service items	Description
>>Maintenance	**Counter reset for the maintenance kit** **Description** The "Install MK" message means that maintenance kit should be replaced at 200,000 images of printing. The interval counter must be manually reset using this service item. MK-500/MK-502 Maintenance kit includes the following units: **MK-500 (For 220 - 240 V AC model)** • Drum unit: DK-500 [Part No.: 2D993040] • Cyan developer unit: DV-500C [Part No.: 2D993080] • Magenta developer unit: DV-500M [Part No.: 2D993070] • Yellow developer unit: DV-500Y [Part No.: 2D993060] • Black developer unit: DV-500K [Part No.: 2D993050] • Fuser unit: FK-500 (E) [Part No.: 2D993150] • Paper feed unit: FE-500 [Part No.: 2D993140] • Primary transfer set: TR-500 [Part No.: 2D993130] (Primary transfer unit and primary transfer cleaning unit [Part No.: 2D993250]) • Ozone filters × 2: [Part No.: 2D902530] • Feed roller set: Retard roller: [Part No.: 5AAVROLL+052] MP tray feed roller: [Part No.: 5AAVROLL+051] **MK-502 (For 120 V AC model)** • Drum unit: DK-500 DRUM UNIT [Part No.: 2D993040] • Cyan developer unit: DV-502C DLP C UNIT [Part No.: 2D993290] • Magenta developer unit: DV-502M DLP M UNIT [Part No.: 2D993280] • Yellow developer unit: DV-502Y DLP Y UNIT [Part No.: 2D993270] • Black developer unit: DV-502K DLP K UNIT [Part No.: 2D993260] • Fuser unit: FK-500 (U) FUSER UNIT [Part No.: 2D993220] • Paper feed unit: FE-500 [Part No.: 2D993140] • Primary transfer set: TR-500 [Part No.: 2D993130] (Primary transfer unit and primary transfer cleaning unit [Part No.: 2D993250]) • Ozone filters × 2: [Part No.: 2D902530] • Feed roller set: Retard roller: [Part No.: 5AAVROLL+052] MP tray feed roller: [Part No.: 5AAVROLL+051] **Purpose** To reset the life counter for the developer units and drum units included in maintenance kit. **Procedure for replacing the maintenance kit** 1. Remove the four old drum units (See page 1-6-12). 2. Remove the LED print head from each old drum unit and then refit to the new drum unit (See page 1-6-13). 3. Install the four new drum units. 4. Replace the four developer units (See page 1-6-11). 5. Replace the fuser unit (See page 1-6-18). 6. Replace the paper feed unit (See page 1-6-5). 7. Replace the primary transfer unit (See page 1-6-14). 8. Replace the primary transfer cleaning unit (See page 1-6-16). 9. Replace the two ozone filters (See page 1-6-35). 10. Replace the retard roller (See page 1-6-7). 11. Replace the MP tray feed roller (See page 1-6-10). **Start** Enter the service mode [>>Maintenance]. Press the ENTER key, “>>Maintenance ?” is displayed. Press the ENTER key twice. The counter for each component is reset immediately. **Completion** Note: Occurrences of resetting the maintenance kits are recorded on the service status page in number of pages or images at which the maintenance kit was replaced (See page 1-4-4). This may be used to determine the possibility that the counter was errorneously or unintentionally reset.

Service items	Description
>>Drum	**Drum surface refreshing** **Description** Rotates the drum approximately 5 minutes with toner lightly applied onto the drum using the high-voltage output control of the engine controller PWB. The cleaning blade in the drum unit scrapes toner off the drum surface to clean it. **Purpose** To clean the drum surface when image failure occurs due to contamination. This mode is useful when dew condensation on the drum occurs. **Procedure** 1. Enter the service mode [>>Drum]. 2. Press the ENTER key. Message “>>Drum?” will be displayed. 3. Press the ENTER key. Drum surface refreshing will start and finish after approximately 3 minutes.

1-4-2 Maintenance

(1) Method of removing the toner soiling which comes in contact with heat roller and Press roller

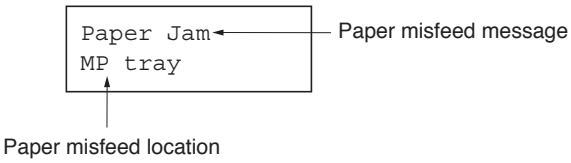
When misfeeding has occurred in the fuser unit, misfeed paper can coil around the heat roller or the press roller. Removing the misfed paper will cause, there are times when the toner soiling remains in the heat roller or the press roller. Follow the procedure below in this case and remove the toner soiling from the heat roller or the press roller.

1. Remove the misfed paper. Cancel misfeed by opening and closing a cover. wait until the message display shows “Ready”.
2. Press [MENU] and set paper type to [Transparency] and paper source to [MP tray].
3. Set the a sheet (transparency sheet [3M CG3700] or thick paper with the of more than weight above 135 g/m^2) to MP tray.
4. Press [MENU] and print a status page. (The toner soiling which comes in contact with the heat roller and the press roller will be transferred onto paper).
5. Until the toner soiling is cleared, repeat (Usually when 4 - 5 it prints, the soiling goes out) the above procedure.

1-5-1 Paper misfeed detection

(1) Paper misfeed indication

When a paper misfeed occurs, the printer immediately stops printing and displays the paper misfeed message on the operator panel. To remove paper misfed in the printer, pull out the paper cassette, pull out the paper feed unit or open the rear cover.



(2) Paper misfeed message display

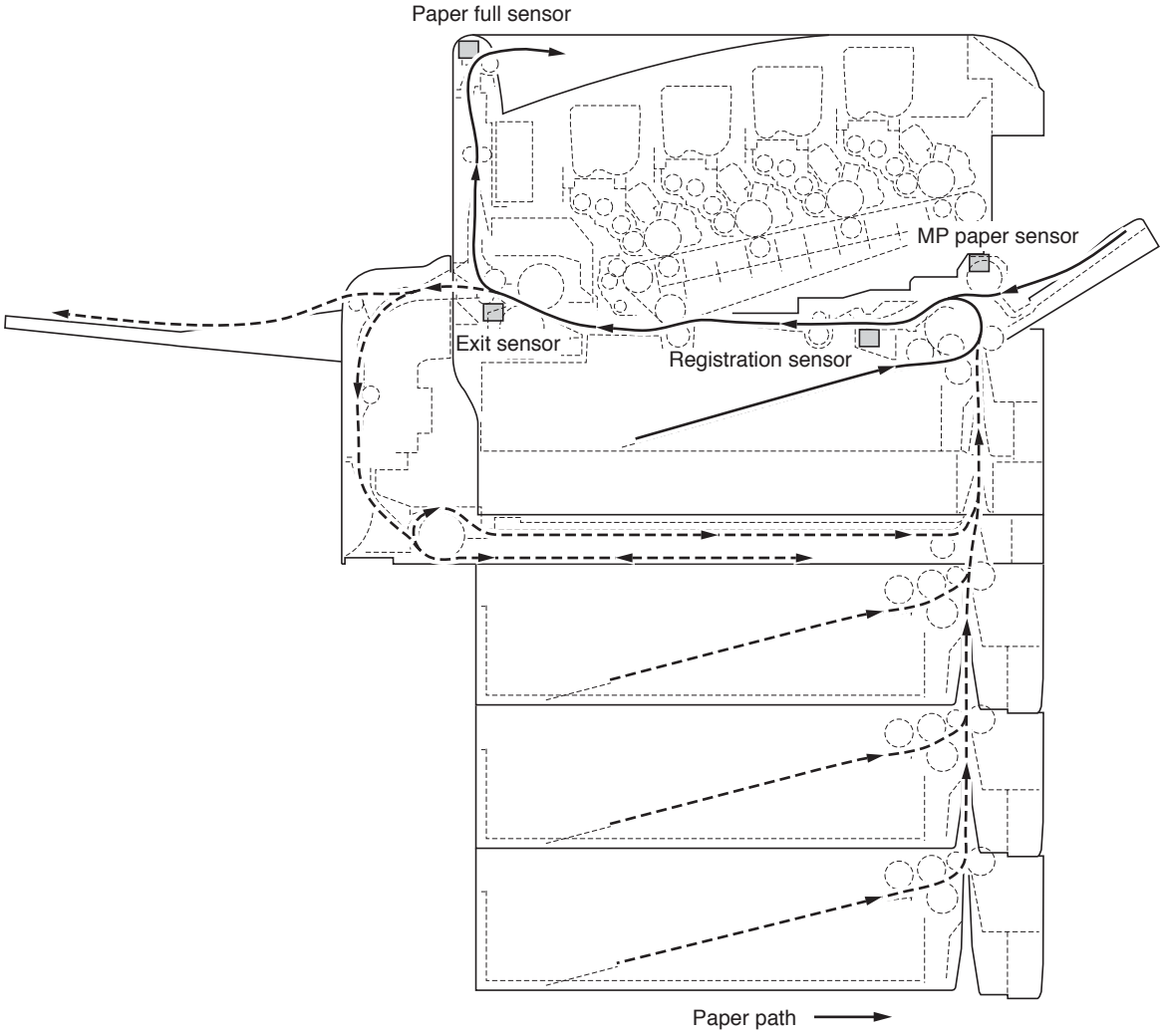


Figure 1-5-1 Paper misfeed detection

1-5-2 Self-diagnosis

(1) Self-diagnostic function

This printer is equipped with self-diagnostic function. When a problem is detected, the printer stops printing and display an error message on the operator panel. An error message consists of a message prompting a contact to service personnel, total print count, and a four-digit error code (2 digits for F0 only) indicating the type of the error. (The display varies depending on the type of the error.)

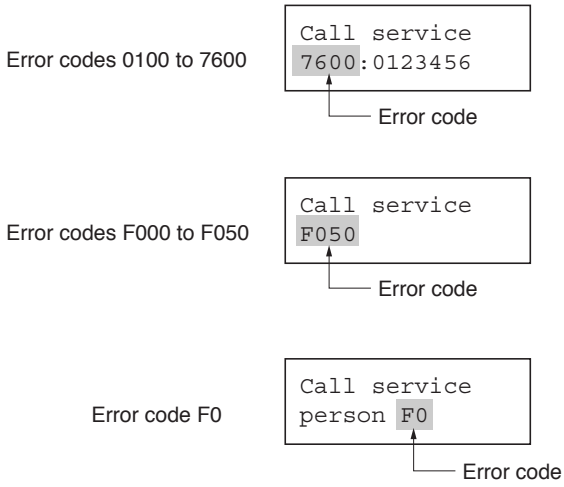


Figure 1-5-2 Error message display

(2) Self-diagnostic code

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0100	**EEPROM (U12) write error** • When it cannot make normal to access to the EEPROM (U12) which is installed in the socket of the engine controller PWB (KP-1054). (The total counter, serial number and engine parameter etc. are stored in the EEPROM [U12]).	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		EEPROM (U12) installing malfunction.	Check the bending of the lead pin and floating of the IC, there is trouble, if there is trouble, remedy or replace.
0150	**EEPROM (U11) write error** • When it cannot make normal to access to the EEPROM (U11) which is mounted on the engine controller PWB (KP-1054).	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
0420	**Paper feeder communication error** • When turning on power, the ASIC of the engine controller PWB (KP-1054) recognized the optional paper feeder PF-60, but when it becomes not be able to communicate from the middle. After the error occurring, when power source is turned on/off, there are times when the paper feeder is not recognized.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective paper feeder PF-60.	After removing or replacing the paper feeder PF-60, do the operation check. If operation is normal, replace the paper feeder PF-60.
		Defective duplexer DU-300.	If the duplexer DU-300 is installed, after removing or replacing the duplexer DU-300, do the operation check. If operation is normal, replace the duplexer DU-300.
		Defective harness (S02852) between engine controller PWB (KP-1054) and interface connector, or poor contact of the connector terminals.	Check the continuity of the harness (S02852). Check the insertion of YC7 of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
0460	**Duplexer communication error** • When turning on power, the ASIC of the engine controller PWB (KP-1054) recognized the optional duplexer DU-300, but when it becomes not be able to communicate from the middle. After the error occurring, when power source is turned on/off, there are times when the duplexer is not recognized.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective duplexer DU-300.	After removing or replacing the duplexer DU-300, do the operation check. If operation is normal, replace the Duplexer DU-300.
		Defective paper feeder PF-60.	If the optional paper feeder PF-60 is installed, after removing or replacing the paper feeder PF-60, do the operation check. If operation is normal, replace the paper feeder PF-60.
		Defective harness (S02852) between engine controller PWB (KP-1054) and interface connector, or poor contact of the connector terminals.	Check the continuity of the harness (S02852). Check the insertion of YC7 of the engine controller PWB, if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0951	**LED print head memory PWB 4 communication error (black drum unit)** • The LED print head memory PWB 4 (KP-1040) which is attached to the LED print head 4 of the Black drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective LED print head memory PWB 4 (KP-1040).	Replace the LED print head 4 of black drum unit. See page 1-6-13.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02866) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02866), check the insertion of YC3 of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective harness (S02866) between LED print head memory PWB 4 (KP-1040) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the connection of the connector with the black drum unit and the printer main unit, check the continuity of the harness (S02866), check the connection of the LED print head memory PWB 4 (KP-1040), if there is trouble, remedy or replace.
0952	**LED print head memory PWB 2 communication error (cyan drum unit)** • The LED print head memory PWB 2 (KP-1040) which is attached to the LED print head 2 of the cyan drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective LED print head memory PWB 2 (KP-1040).	Replace the LED print head 2 of cyan drum unit. See page 1-6-13.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02866) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02866), check the insertion of YC3 of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective harness (S02866) between LED print head memory PWB 2 (KP-1040) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the connection of the connector with the cyan drum unit and the printer main unit, check the continuity of the harness (S02866), check the connection of the LED print head memory PWB 2 (KP-1040), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
0953	**LED print head memory PWB 1 communication error (magenta drum unit)** • The LED print head memory PWB 2 (KP-1040) which is attached to the LED print head 1 of the magenta drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective LED print head memory PWB 1 (KP-1040).	Replace the LED print head 1 of magenta drum unit. See page 1-6-13.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02866) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02866), check the insertion of YC3 of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective harness (S02866) between LED print head memory PWB 1 (KP-1040) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the connection of the connector with the magenta drum unit and the printer main unit, check the continuity of the harness (S02866), check the connection of the LED print head memory PWB 1 (KP-1040), if there is trouble, remedy or replace.
0954	**LED print head memory PWB 3 communication error (yellow drum unit)** • LED print head memory PWB 3 communication error (yellow drum unit) • The LED print head memory PWB 3 (KP-1040) which is attached to the LED print head 3 of the yellow drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective LED print head memory PWB 3 (KP-1040).	Replace the LED print head 3 of yellow drum unit. See page 1-6-13.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02866) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02866), check the insertion of YC3 of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective harness (S02866) between LED print head memory PWB 3 (KP-1040) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the connection of the connector with the yellow drum unit and the printer main unit, check the continuity of the harness (S02866), check the connection of the LED print head memory PWB 3 (KP-1040), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
1200	**Side registration motor error** • The duplexer PWB of the optional duplexer cannot detect the home position of the adjust guide.	Defective duplexer DU-300.	Refer to the duplexer DU-300's service manual.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
2610	**Paper feed motor error (top)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (top).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
2620	**Paper feed motor error (middle)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (middle).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
2630	**Paper feed motor error (bottom)** • The notification that was received, the motor clock sensor cannot detect the revolution of the paper feed motor of the optional paper feeder (third).	Defective paper feeder PF-60.	Refer to the paper feeder PF-60's service manual.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
5301	**Eraser lamp 4 error (black drum unit)** • The eraser lamp 4 [PWB] (KP-976) of the black drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective eraser lamp 4 [PWB] (KP-976).	Replace the eraser lamp 4 [PWB] (KP-976).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective drum PWB 4 (KP-972).	Replace the black drum unit. See page 1-6-12.
		Defective harness between drum PWB (KP-972) and eraser lamp 4 [PWB] (KP-976), or poor contact of the connector terminals.	Check the connection of the YC401 connector of the drum PWB (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
5302	**Eraser lamp 2 error (cyan drum unit)** • The eraser lamp 2 [PWB] (KP-976) of the cyan drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective eraser lamp 2 [PWB] (KP-976).	Replace the eraser lamp 2 [PWB] (KP-976).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective drum PWB 2 (KP-972).	Replace the cyan drum unit. See page 1-6-12.
		Defective harness between drum PWB 2 (KP-972) and eraser lamp 2 [PWB] (KP-976), or poor contact of the connector terminals.	Check the connection of the YC401 connector of the drum PWB 2 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
5303	**Eraser lamp 1 error (magenta drum unit)** • The eraser lamp 1 [PWB] (KP-976) of the cyan drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective eraser lamp 1 [PWB] (KP-976).	Replace the eraser lamp 1 [PWB] (KP-976).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective drum PWB 1 (KP-972).	Replace the magenta drum unit. See page 1-6-12.
		Defective harness between drum PWB 1 (KP-972) and eraser lamp 1 [PWB] (KP-976), or poor contact of the connector terminals.	Check the connection of the YC401 connector of the drum PWB 1 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
5304	**Eraser lamp 3 error (yellow drum unit)** • The eraser lamp 3 [PWB] (KP-976) of the yellow drum unit does not communicate with the engine controller PWB (KP-1054) normally.	Defective eraser lamp 3 [PWB] (KP-976).	Replace the eraser lamp 3 [PWB] (KP-976).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective drum PWB 3 (KP-972).	Replace the yellow drum unit. See page 1-6-12.
		Defective harness between drum PWB 3 (KP-972) and eraser lamp 3 [PWB] (KP-976), or poor contact of the connector terminals.	Check the connection of the YC401 connector of the drum PWB 3 (KP-972), if there is trouble, remedy or replace.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048), or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.

Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
6000	**Fuser temperature time-out error (heat roller)** • Doing the control which turns on the fuser heater lamp 1 which is built in to the heat roller of the fuser unit, the fuser temperature which fuser thermistor 1 detects stipulated temperature did not rise within stipulated time.	Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1, if there is trouble, remedy or replace. See page 1-6-18.
		Fuser thermostat 1 operated.	Replace the Fuser thermostat 1. See page 1-6-18.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective harness of the fuser thermistor 1, or poor contact of the connector terminals.	Check the harness of the fuser thermistor 1, check the connection YC694 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective fuser heater lamp 1.	Replace the fuser heater lamp 1. See page 1-6-18.
		Defective harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model) between fuser unit connector and fuser heater lamp 1.	Check the continuity of the harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model), check the connection YC694 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02856) between fuser unit connector and power supply PWB.	Check the continuity of the harness (S02856), check the connection CN2 connector of the power supply PWB, if there is trouble, remedy or replace.
6020	**Fuser abnormal high temperature error (heat roller)** • Abnormal high fuser temperature of the heat roller was detected.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective fuser PWB (KP-970)	Replace the fuser PWB (KP-970).
		Defective power supply PWB (KP-1054).	Replace the power supply PWB. See page 1-6-25.
		Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1,if there is trouble, remedy or replace. See page 1-6-18.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6030	**Fuser thermistor 1 broken error (heat roller)** • It was judged it has been broken from the fact that it is not the input signal from of the fuser thermistor 1 which detects the fuser temperature of the heat roller.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective harness of the fuser PWB (KP-970) between fuser thermistor 1 or poor contact of the connector terminals.	Check harness of the fuser PWB (KP-970), check the connection YC694 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02854) between fuser PWB (KP-970) and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02854), check the connection YC691 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02853) power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-26.
		Defective installation condition of fuser thermistor 1.	Check the installation condition of fuser thermistor 1, if there is trouble, remedy or replace. See page 1-6-18.

Code	Contents	Remarks	
		Causes	**Check procedures/corrective measures**
6100	**Fuser temperature time-out error (press roller)** • Doing the control which turns on the fuser heater lamp 2 which is built in to the press roller of the fuser unit, the fuser temperature which fuser thermistor 2 detects stipulated temperature did not rise within stipulated time.	Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2,if there is trouble, remedy or replace. See page 1-6-18.
		Fuser thermostat 2 operated.	Replace the Fuser thermostat 2. See page 1-6-18.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective harness of the fuser thermistor 2, or poor contact of the connector terminals.	Check the harness of the fuser thermistor 1, check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective fuser heater lamp 2.	Replace the fuser heater lamp 2. See page 1-6-18.
		Defective harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model) between fuser unit connector and fuser heater lamp 2.	Check the continuity of the harness (S02857: 220 - 240 V AC model, S02858: 120 V AC model), check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02856) between fuser unit connector and power supply PWB.	Check the continuity of the harness (S02856), check the connection CN2 connector of the power supply PWB, if there is trouble, remedy or replace.
6120	**Fuser abnormal high temperature error (press roller)** • Abnormal high fuser temperature of the press roller was detected.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.
		Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2, if there is trouble, remedy or replace. See page 1-6-18.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
6130	**Fuser thermistor 2 broken error (press roller)** • It was judged it has been broken from the fact that it is not the input signal from of the fuser thermistor 2 which detects the fuser temperature of the press roller.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective harness of the fuser PWB (KP-970) between fuser thermistor 2 or poor contact of the connector terminals.	Check harness of the fuser PWB (KP-970), check the connection YC693 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02854) between fuser PWB (KP-970) and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02854), check the connection YC691 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
		Defective harness (S02853) power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
		Defective fuser PWB (KP-970).	Replace the fuser PWB (KP-970).
		Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.
		Defective installation condition of fuser thermistor 2.	Check the installation condition of fuser thermistor 2, if there is trouble, remedy or replace. See page 1-6-18.
6400	**Zero cross signal error** • The zero cross signal which from the POWER supply PWB is outputted to the engine controller PWB (KP-1054) was not detected.	Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
7001	**Toner motor 4 overcurrent detection error (black toner)** • The engine controller PWB (KP-1054) detected the overcurrent of toner motor 4.	Defective toner motor 4.	Replace the toner motor 4. See page 1-6-34.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Lump of toner inside black toner container or defectiveness of toner replenishment drive system.	Replace the black toner container.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7002	**Toner motor 2 overcurrent detection error (cyan toner)** • The engine controller PWB (KP-1054) detected the overcurrent of toner motor 2.	Defective toner motor 2.	Replace the toner motor 2. See page 1-6-34.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Lump of toner inside cyan toner container or defectiveness of toner replenishment drive system.	Replace the cyan toner container.
7003	**Toner motor 1 overcurrent detection error (magenta toner)** • The engine controller PWB (KP-1054) detected the overcurrent of toner motor 1.	Defective toner motor 1.	Replace the toner motor 1. See page 1-6-34.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Lump of toner inside magenta toner container or defectiveness of toner replenishment drive system.	Replace the magenta toner container.
7004	**Toner motor 3 overcurrent detection error (yellow toner)** • The engine controller PWB (KP-1054) detected the overcurrent of toner motor 3.	Defective toner motor 3.	Replace the toner motor 3. See page 1-6-34.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Lump of toner inside yellow toner container or defectiveness of toner replenishment drive system.	Replace the yellow toner container.
7401	**Black developer unit non- installing error** • The toner sensor 4 inside the black developer unit did not output the density detection signal, judged the engine controller PWB (KP-1054) the black developer unit is not installed.	Defective harness of the toner sensor 4, defective connection of the connector between black developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 4, check the connection of the connector with the black developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 4.	Replace the black developer unit. See page 1-6-11.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective engine relay PWB (KP-966).	Replace the engine relay PWB (KP-966).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7402	**Magenta developer unit non- installing error** • The toner sensor 1 inside the magenta developer unit did not output the density detection signal, judged the engine controller PWB (KP-1054) the magenta developer unit is not installed.	Defective harness of the toner sensor 1, defective connection of the connector between magenta developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 1, check the connection of the connector with the magenta developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 1.	Replace the magenta developer unit. See page 1-6-11.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective engine relay PWB (KP-966).	Replace the engine relay PWB (KP-966).
7403	**Cyan developer unit non- installing error** • The toner sensor 2 inside the cyan developer unit did not output the density detection signal, judged the engine controller PWB (KP-1054) the cyan developer unit is not installed.	Defective harness of the toner sensor 2, defective connection of the connector between cyan developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 2, check the connection of the connector with the cyan developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 2.	Replace the cyan developer unit. See page 1-6-11.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective engine relay PWB (KP-966).	Replace the engine relay PWB (KP-966).
7404	**Yellow developer unit non- installing error** • The toner sensor 3 inside the yellow developer unit did not output the density detection signal, judged the engine controller PWB (KP-1054) the yellow developer unit is not installed.	Defective harness of the toner sensor 3, defective connection of the connector between yellow developer unit and the printer main unit or poor contact of the connector terminals.	Check the damage of harness of the toner sensor 3, check the connection of the connector with the yellow developer unit and the printer main unit, if there is trouble, remedy or replace.
		Defective toner sensor 3.	Replace the yellow developer unit. See page 1-6-11.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective engine relay PWB (KP-966).	Replace the engine relay PWB (KP-966).

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7411	**Black drum unit non- installing error** • The EEPROM (U401) on the drum PWB 4 (KP-972) inside the black drum unit does not communicate normally.	Defective harness between drum PWB 4 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the black drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Defective drum PWB 4 (KP-972).	Replace the drum PWB 4 (KP-972).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
7412	**Cyan drum unit non- installing error** • The EEPROM (U401) on the drum PWB 2 (KP-972) inside the cyan drum unit does not communicate normally.	Defective harness between drum PWB 2 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the cyan drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Defective drum PWB 2 (KP-972).	Replace the drum PWB 2 (KP-972).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7413	**Magenta drum unit non- installing error** • The EEPROM (U401) on the drum PWB 1 (KP-972) inside the magenta drum unit does not communicate normally.	Defective harness between drum PWB 1 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the magenta drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Defective drum PWB 1 (KP-972).	Replace the drum PWB 1 (KP-972).
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
7414	**Yellow drum unit non- installing error** • The EEPROM (U401) on the drum PWB 3 (KP-972) inside the yellow drum unit does not communicate normally.	Defective harness between drum PWB 3 (KP-972) and printer main unit or poor contact of the connector terminals.	Check the connection of the magenta drum unit and the printer main unit, check the continuity of the harness (S02867), if there is trouble, remedy or replace.
		Defective drum PWB 3 (KP-972).	Replace the drum PWB 3 (KP-972).
		Defective LED print heads relay PWB (KP-1048).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective LED print heads relay PWB (KP-1048).	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
		Defective harness (S02869) between engine controller PWB (KP-1054) and LED print heads relay PWB (KP-1048) or poor contact of the connector terminals.	Check the continuity of the harness (S02869), check the connection YC3 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
7600	**Toner ID sensor error** • The detection signal of the toner ID sensor was abnormal value.	Defective toner ID sensor.	Replace the toner ID sensor.
		Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-26.
		Defective harness (S02865) between engine controller PWB (KP-1054) and toner ID sensor or poor contact of the connector terminals.	Check the continuity of the harness (S02865), check the connection YC11 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
F0 (F000)	**Operation panel PWB communication error** • The operation panel PWB (KP-962) does not communicate to the main controller PWB (KP-957) normally 30 seconds.	Defective main controller PWB (KP-957).	Replace the main controller PWB (KP-957). See page 1-6-24.
		Defective operation panel PWB (KP-962).	Replace the operation panel PWB (KP-962).
F010	**System DIMM PWB checksum error** • The system DIMM PWB (KP-893) which stores the program checksum did not coincide.	Defective system DIMM PWB (KP-893).	Replace the system DIMM PWB (KP-893).
		Defective main controller PWB (KP-957).	Replace the main controller PWB (KP-957). See page 1-6-24.
F020	**Main controller PWB memory check error** • It could not access to the standard memory or the optional expanding memory which are mounted on the main PWB (KP-957) normally.	Defective main controller PWB (KP-957).	Replace the main controller PWB (KP-1054). See page 1-6-24.
		Defective expanding memory.	If the expanding memory is installed, after removing or replacing the expanding memory, do the operation check. If operation is normal, replace the expanding memory. See page 1-3-7.
F030	**Main controller PWB system error** • The error which is related to the system other than the error code F0 (F010) and F020 occurred.	Defective main controller PWB (KP-957).	Replace the main controller PWB (KP-1054). See page 1-6-24.
F040	**Engine controller PWB communication error** • The main controller PWB (KP-957) does not communicate to the engine controller PWB (KP-1054) normally.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
		Defective main controller PWB (KP-957).	Replace the main controller PWB (KP-957). See page 1-6-24.
F050	**Engine controller PWB flash ROM error** • Abnormality occurring in the flash ROM which is mounted on the engine controller PWB (KP-1054), the main controller PWB (KP-957) received notification.	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.

1-5-3 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) "Close top cover" display is not cancelled to closing the top cover.	Right edge of the top cover floating, it is not closed completely.	Close the top cover securely.
	Defective top cover switch 2.	Replace the top cover switch 2.
	Defective top cover/paper feed unit switch (SW701) of the sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Defective harness (S02846) between engine controller PWB (KP-1054) and top cover switch 2 or poor contact of the connector terminals.	Check the continuity of the harness (S02846), check the connection YC11 connector of the engine controller PWB (KP-1054), if there is trouble, remedy or replace.
	Malfunctioning interlock rod that interfaces between the top cover and the top cover/paper feed unit switch (SW701).	Check to see if the interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
	Defective harness (S02849) between engine controller PWB (KP-1054) and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (KP-1054), check the connection YC701 and YC702 connectors of the sensor PWB (KP-982), if there is trouble, remedy or replace.
(2) "Close side cover" display is not cancelled to closing the top cover.	Defective side cover switch (SW702) of the sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	The actuator of the side cover switch (SW702) of the sensor PWB (KP-982) is bent.	Check the bending of the actuator of the side cover switch, if there is trouble, remedy or replace.
	Defective sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
	Defective harness (S02849) between engine controller PWB (KP-1054) and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (KP-1054), check the connection YC701 and YC702 connectors of the sensor PWB (KP-982), if there is trouble, remedy or replace.

Problem	Causes	Check procedures/corrective measures
(3) "Close paper transfer unit" display is not cancelled to closing the paper feed unit.	Defective top cover/paper feed unit switch (SW701) of the sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Malfunctioning interlock rod that interfaces between the top cover and the top cover/ paper feed unit switch (SW701).	Check to see if the interlock rod malfunctions. If it malfunctions, repair it.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
	Defective harness (S02849) between engine controller PWB (KP-1054) and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (KP-1054), check the connection YC701 and YC702 connectors of the sensor PWB (KP-982), if there is trouble, remedy or replace.
(4) "Cassette 1 not loaded" display is not cancelled to closing the paper cassette.	Defective cassette size switch.	Replace the cassette size switch.
	Defective sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Defective harness (S02861) between cassette size switch and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02861), check the connection YC703 connector of sensor PWB (KP-982), if there is trouble, remedy or replace.
	Defective harness (S02849) between engine controller PWB (KP-1054) and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (KP-1054), check the connection YC701 and YC702 connectors of the sensor PWB (KP-982), if there is trouble, remedy or replace.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
(5) "Check waste toner box" display is not cancelled to replacing the waste toner box.	The waste toner full sensor or the waste toner full sensor [PWB] (KP-974) the sensor section is dirty.	Replace the waste toner full sensor or the waste toner full sensor [PWB] (KP-974).
	Defective harness (S02863) between bias high voltage PWB (KP-980) and waste toner full sensor [PWB] (KP-974) or poor contact of the connector terminals.	Check the continuity of the harness (S02863), check the connection of YC802 connector of the bias high voltage PWB (KP-980), check the connection of YC682 connector of the waste toner full sensor [PWB] (KP-974) if there is trouble, remedy or replace.
	Defective harness (S02862) between waste toner full sensor and waste toner full sensor [PWB] (KP-974) or poor contact of the connector terminals.	Check the continuity of the harness (S02862), check the connection YC681 connector of the waste toner full sensor [PWB] (KP-974), if there is trouble, remedy or replace.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.

Problem	Causes	Check procedures/corrective measures
(6) The paper size is not recognized as the size set with the paper size dial.	Defective cassette size switch.	Replace the cassette size switch.
	Defective sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Defective harness (S02861) between cassette size switch and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02861), check the connection YC703 connector of sensor PWB (KP-982), if there is trouble, remedy or replace.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
(7) Paper misfeed display is not cancelled.	Defective registration sensor.	Replace the sensor PWB (KP-982).
	Defective sensor PWB (KP-982).	Replace the sensor PWB (KP-982).
	Defective harness (S02849) between engine controller PWB (KP-1054) and sensor PWB (KP-982) or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC2 connector of the engine controller PWB (KP-1054), check the connection YC701 and YC702 connectors of the sensor PWB (KP-982), if there is trouble, remedy or replace.
	Defective exit sensor.	Replace the fuser PWB (KP-970).
	Defective harness (S02849) between fuser PWB (KP-970) and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02849), check the connection YC691 connector of the fuser PWB (KP-970), if there is trouble, remedy or replace.
	Defective harness (S02853) between power supply PWB and fuser connector or poor contact of the connector terminals.	Check the continuity of the harness (S02853), check the connection YC902 connector of the power supply PWB, if there is trouble, remedy or replace.
	Defective engine controller PWB (KP-1054).	Replace the engine controller PWB (KP-1054). See page 1-6-25.
	Defective power supply PWB.	Replace the power supply PWB. See page 1-6-25.

1-5-4 Image formation problems

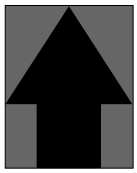
(1) No image appears (entirely white).

P.1-5-22

(2) No image appears (entirely black).

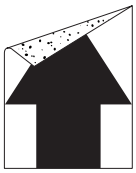
P.1-5-22

(3) A specific color is printed solid.



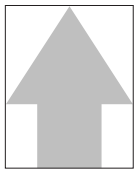
P.1-5-23

(4) The back side gets dirty.



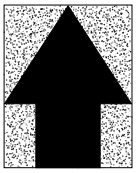
P.1-5-23

(5) Image is too light.



P.1-5-24

(6) The background is colored.

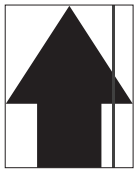


P.1-5-24

(7) White streaks are printed vertically.

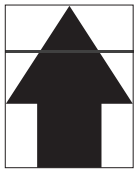
P.1-5-25

(8) Black streaks are printed vertically.



P.1-5-25

(9) Streaks are printed horizontally.



P.1-5-26

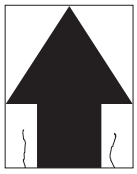
(10) Spots are printed.

P.1-5-26

(11) The leading edge of image begins to print too early or too late.

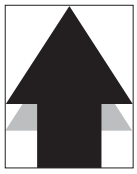
P.1-5-26

(12) Paper is wrinkled.



P.1-5-27

(13) Offset occurs.

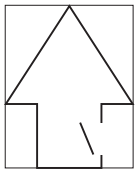


P.1-5-27

(14) Part of image is missing.

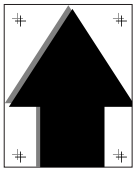
P.1-5-27

(15) Fusing is loose.



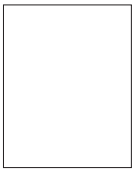
P.1-5-28

(16) Colors are printed offset to each other.



P.1-5-28

(1) No image appears (entirely white).



Causes
1. The LED print head has not done functioning.
2. Defective developing sleeve bias or developing magnet bias output.
3. Defective secondary transfer bias output.
4. Malfunction of the developer installation.

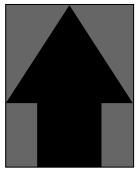
Causes	Check procedures/corrective measures
1. The LED print head has not done functioning.	
A. Loose connection with drum connectors.	Check connection between the drum unit and the unit frame. If necessary, secure the connection. (Do not attempt to disconnect/connect the connector while power is on.)
B. Loose connection with the LED print head connector.	Check CN2 (LED print head connector) for connection. If necessary, secure the connection. (Do not attempt to disconnect/connect the connector while power is on.)
C. Defective main controller PWB.	Replace the main controller PWB (KP-957). See page 1-6-24.
D. Defective LED print heads relay PWB. See page 1-6-26.	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.
2. Defective developing sleeve bias or developing magnet bias output.	
A. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
B. Defective main high voltage PWB.	Replace the main high voltage PWB (KP-978). See page 1-6-30.
3. Defective secondary transfer bias output.	
A. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB (KP-980). See page 1-6-30.
4. Malfunction of the developer installation.	Reinstall the developer. See page 1-6-11.

(2) No image appears (entirely black).

Causes
1. No main charging.
2. Defective LED print heads relay PWB.

Causes	Check procedures/corrective measures
1. No main charging.	
A. Poor contact of output terminal of main high voltage PWB.	Check the installation of the main high voltage PWB (KP-978), If it installation incorrectly, reinstall it.See page 1-6-29.
B. Defective main high voltage PWB.	Replace the main high voltage PWB (KP-978). See page 1-6-29.
C. Poor contact of output terminal of main high voltage PWB.	Check the installation of the main high voltage PWB (KP-978), If it installation incorrectly, reinstall it.See page 1-6-30
D. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
2. Defective LED print heads relay PWB.	Replace the LED print heads relay PWB (KP-1048). See page 1-6-28.

(3) A specific color is printed solid.

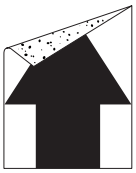


Causes

1. Defective main charger unit which corresponds to the color causing the problem.
2. Disconnected main charger wire.

Causes	Check procedures/corrective measures
1. Defective main charger unit which corresponds to the color causing the problem.	Check if the main charger unit is properly seated. If necessary, reseat it properly.
2. Disconnected main charger wire.	Replace main charger unit.

(4) The back side gets dirty.

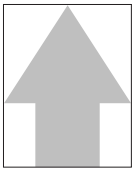


Causes

1. Dirty secondary transfer roller.
2. Dirty paper conveying path of the paper feed unit.
3. Dirty heat roller and press roller.

Causes	Check procedures/corrective measures
1. Dirty secondary transfer roller.	Clean the secondary transfer roller.
2. Dirty paper conveying path of the paper feed unit.	Clean the paper conveying path of the paper feed unit.
3. Dirty heat roller and press roller.	Clean the heat roller and press roller. See page 1-4-14.

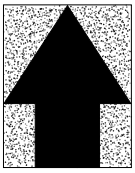
(5) Image is too light.



Causes
1. Defective developing bias output.
2. Dirty drum.
3. Dirty SELFOC lens of LED print head.

Causes	Check procedures/corrective measures
1. Defective developing bias output.	
A. Defective developer.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the developer for that color. See pages 1-4-11, 1-6-11.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB (KP-980). See page 1-6-30.
A. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
B. Defective main controller PWB.	Replace the main controller PWB (KP-957). See page 1-6-24.
C. Defective drum unit.	Replace the drum unit. See page 1-6-12.
2. Dirty drum.	Perform the drum surface refreshing. See page 1-4-12.
3. Defective color calibration.	
A. Dirty sensing surface of the toner ID sensor.	Clean the sensing surface of the toner ID sensor.
B. The printer environment considerably changed since an automatic calibration was made.	Perform the color calibration of service mode. See page 1-4-10.
4. Dirty SELFOC lens of LED print head.	Clean the SELFOC lens of LED print head by using LED cleaner.

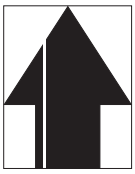
(6) The background is colored.



Causes
1. Defective developing sleeve bias output.
2. Defective primary transfer cleaning unit.
3. Defective color calibration.

Causes	Check procedures/corrective measures
1. Defective developing sleeve bias output.	
A. Defective developer.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the developer for that color. See pages 1-4-11, 1-6-11.
B. Defective bias high voltage PWB.	Replace the bias high voltage PWB (KP-980). See page 1-6-30.
C. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
D. Defective main controller PWB.	Replace the main controller PWB (KP-957). See page 1-6-24.
E. Defective drum unit.	Replace the drum unit. See page 1-6-12.
2. Defective primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-16.
3. Defective color calibration.	
A. Dirty sensing surface of the toner ID sensor.	Clean the sensing surface of the toner ID sensor.
B. The printer environment considerably changed since an automatic calibration was made.	Perform the color calibration of service mode. See page 1-6-17.

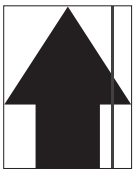
(7) White streaks are printed vertically.



Causes
1. Defective LED print head output.
2. Defective main charging output.
3. Foreign object in one of the developers.
4. Adhesion of soiling to primary transfer belt.

Causes	Check procedures/corrective measures
1. Defective LED print head output.	
A. Poor insertion of LED cleaner.	Check if the LED cleaner unit is properly seated. If necessary, reseat it properly.
B. Dirty SELFOC lens of LED print head.	Clean the SELFOC lens of LED print head by using LED cleaner.
C. Focus is lost with the LED print head.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the LED print head for that color. See page 1-4-13
D. Defective LED print head.	Check the four colors of image by using the test print of service mode. If the defect appears on a particular color, replace the LED print head for that color. See page 1-4-13.
2. Defective main charging output.	
A. Adhesion of oxide to main charger wire.	Clean the main charger wire by using main charger wire cleaner.
B. Dirty main charger grid.	Clean the main charger wire by using main charger grid cleaner.
C. Dirty main charger shield.	Replace the main charger unit.
3. Foreign object in one of the developers.	Check the image by using the test print of service mode. If the white line appears on a particular page, replace the developer for that color (See page 1-4-11, 1-6-11).
4. Adhesion of soiling to primary transfer belt.	Replace the primary transfer unit. See page 1-6-14.

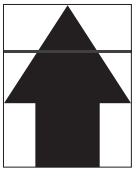
(8) Black streaks are printed vertically.



Causes
1. Dirty main charger wire.
2. Poor insertion of the main charger wire cleaner.
3. Dirty or flawed drum.
4. Deformed or worn cleaning blade in the drum unit.
5. Defect fur brush of the primary transfer cleaning unit.
6. Worn primary transfer belt.

Causes	Check procedures/corrective measures
1. Dirty main charger wire.	Clean the main charger wire by using main charger wire cleaner.
2. Poor insertion of the main charger wire cleaner.	Check if the main charger wire cleaner is properly seated. If necessary, reseat it properly.
3. Dirty or flawed drum.	
A. Dirty drum.	Perform the drum surface refreshing. See page 1-4-13.
B. Flawed drum.	Replace the drum unit. See page 1-6-12.
4. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-12.
5. Defect fur brush of the primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-16.
6. Worn primary transfer belt.	Replace the primary transfer unit. See page 1-6-14.

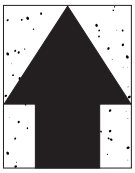
(9) Streaks are printed horizontally.



Causes
1. Poor contact of output terminal of main charger unit.
2. Poor contact of grounding terminal of drum unit.
3. Poor contact of developing bias terminal of developer.

Causes	Check procedures/corrective measures
1. Poor contact of output terminal of main charger unit.	Insert the main charger properly.
2. Poor contact of grounding terminal of drum unit.	Replace the drum unit. See page 1-6-12.
3. Poor contact of developing bias terminal of developer.	Replace the developer. See page 1-6-11.

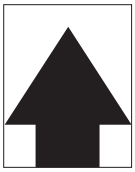
(10) Spots are printed.



Causes
1. Dirty or flawed drum.
2. Deformed or worn cleaning blade in the drum unit.
3. Defect fur brush of the primary transfer cleaning unit.
4. Flawed developing sleeve roller.
5. Dirty heat roller and press roller.

Causes	Check procedures/corrective measures
1. Dirty or flawed drum.	Perform the drum surface refreshing. See page 1-4-13.
2. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-12.
3. Defect fur brush of the primary transfer cleaning unit.	Replace the primary transfer cleaning unit. See page 1-6-16.
4. Flawed developing sleeve roller.	Replace the developer. See page 1-6-11.
5. Dirty heat roller and press roller.	Perform the heat roller and press roller cleaning. See page 1-4-14.

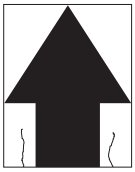
(11) The leading edge of image begins to print too early or too late.



Causes
1. Registration clutch operating incorrectly.
2. Defective engine controller PWB.
3. Defective main controller PWB.

Causes	Check procedures/corrective measures
1. Registration clutch operating incorrectly.	Check the installation of the registration clutch. If it operates incorrectly, replace it.
2. Defective engine controller PWB.	Replace the engine controller PWB (KP-1054). See page 1-6-25.
3. Defective main controller PWB.	Replace the main controller PWB (KP-957). See page 1-6-24.

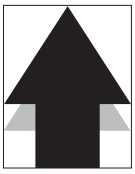
(12) Paper is wrinkled.



Causes
1. Paper curled.
2. Paper damp.

Causes	Check procedures/corrective measures
1. Paper curled.	Check the paper storage conditions, replace the paper.
2. Paper damp.	Check the paper storage conditions, replace the paper.

(13) Offset occurs.



Causes
1. Deformed or worn cleaning blade in the drum unit.
2. Wrong types of paper.

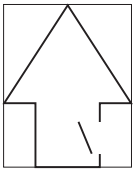
Causes	Check procedures/corrective measures
1. Deformed or worn cleaning blade in the drum unit.	Replace the drum unit. See page 1-6-12.
2. Wrong types of paper.	Check if the paper meets specifications. Replace paper.

(14) Part of image is missing.

Causes
1. Paper damp.
2. Paper creased.
3. Drum condensation.
4. Flawed drum.
5. Flawed primary transfer belt.

Causes	Check procedures/corrective measures
1. Paper damp.	Check the paper storage conditions, replace the paper.
2. Paper creased.	Replace the paper.
3. Drum condensation.	Perform the drum surface refreshing. See page 1-4-13.
4. Flawed drum.	Replace the drum unit. See page 1-6-12.
5. Flawed primary transfer belt.	Replace the primary transfer unit. See page 1-6-14.

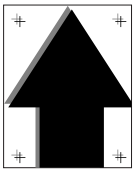
(15) Fusing is loose.



Causes
1. Wrong types of paper.
2. Defective pressure for the heat roller and press roller.
3. Flawed heat roller or press roller.

Causes	Check procedures/corrective measures
1. Wrong types of paper.	Check if the paper meets specifications, replace paper.
2. Defective pressure for the heat roller and press roller.	Check the fuser pressure springs.
3. Flawed heat roller or press roller.	Replace the heat roller or press roller. See page 1-6-18.

(16))Colors are printed offset to each other.



Causes
1. The drum unit is not properly seated in its position.

Causes	Check procedures/corrective measures
1. The drum unit is not properly seated in its position.	Perform the color registration to correct (Refer to user's manual).

1-6-1 Precautions for assembly and disassembly

(1) Precautions

- Be sure to turn the power switch off and disconnect the power plug before starting disassembly.
- When handling PWBs (printed wiring boards), do not touch parts with bare hands. The PWBs are susceptible to static charge.
- Do not touch any PWB containing ICs with bare hands or any object prone to static charge.
- Use the following circuit testers when measuring voltages:
  Hioki 3200
  Sanwa MD-180C
  Sanwa YX-360TR

1-6-2 Outer covers

(1) Detaching and refitting the top cover

Procedure

1. Open the rear cover.
2. Open the top cover.
3. Remove the opening and closing axis from the main unit frame and then remove the upper cover.

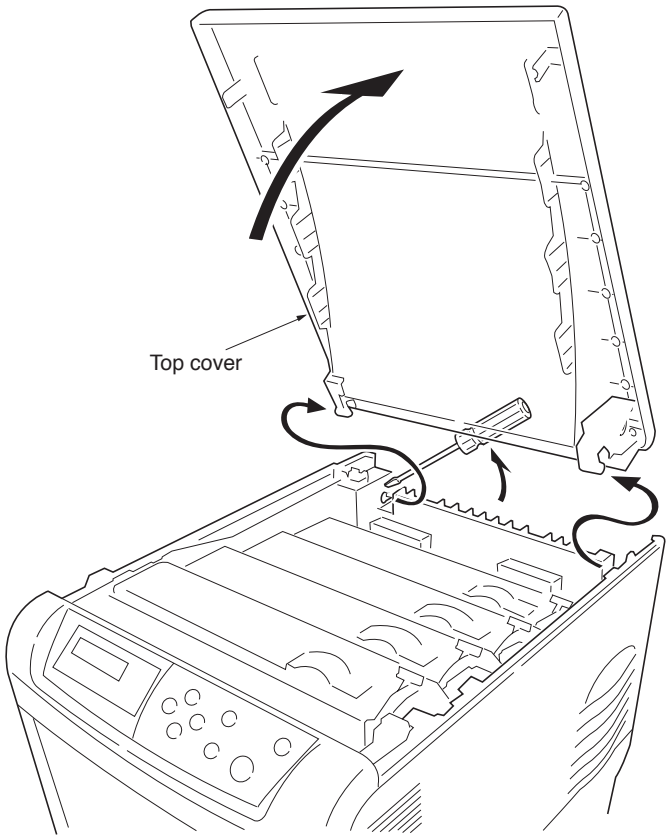


Figure 1-6-1

(2) Detaching and refitting the rear cover

Procedure

1. Open the rear cover.
2. Remove the opening and closing axis from the main unit frame and then remove the rear cover.

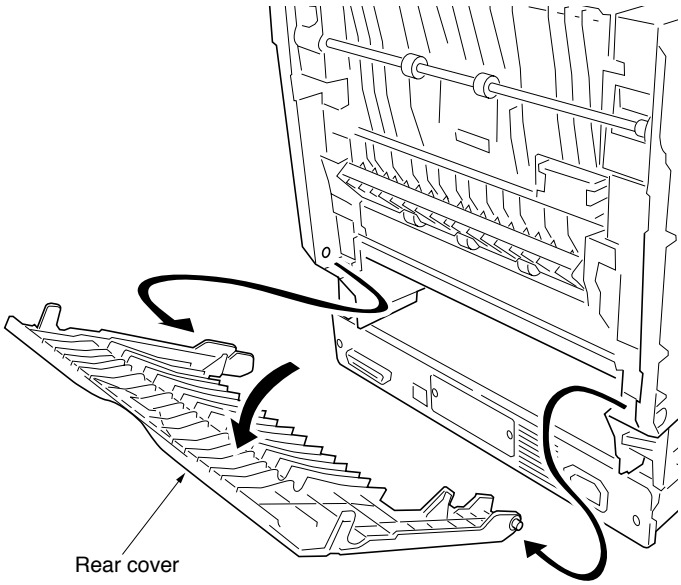


Figure 1-6-2

(3) Detaching and refitting the right cover

Procedure

1. Remove the top cover (see page 1-6-2).
2. Remove the one screw.

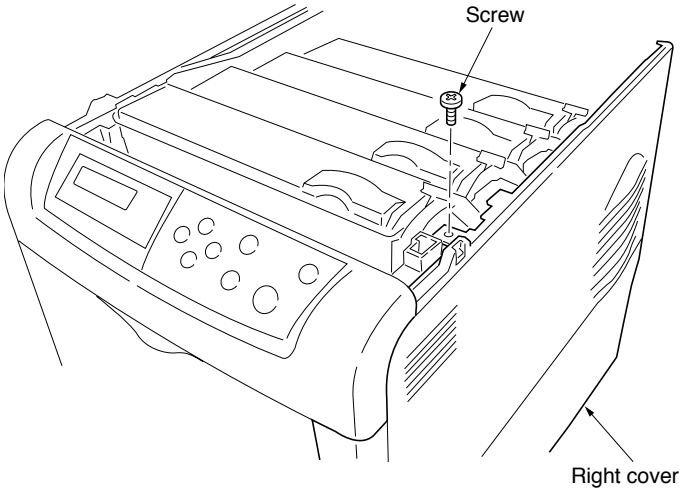


Figure 1-6-3

3. Remove the paper feed unit (see page 1-6-5).
4. Using a flat blade screwdriver, unlatch the right cover at the nine positions as shown in the diagram.

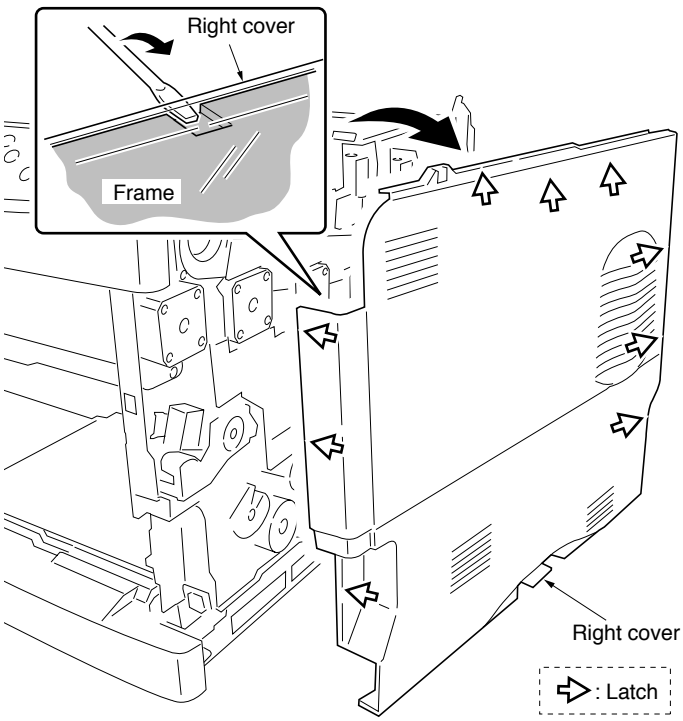


Figure 1-6-4

(4) Detaching and refitting the left cover

Procedure

1. Remove the top cover (see page 1-6-2).
2. Open the side cover and then remove the one screw.
3. Remove the waste toner box. To remove waste toner box, press the lock lever in.

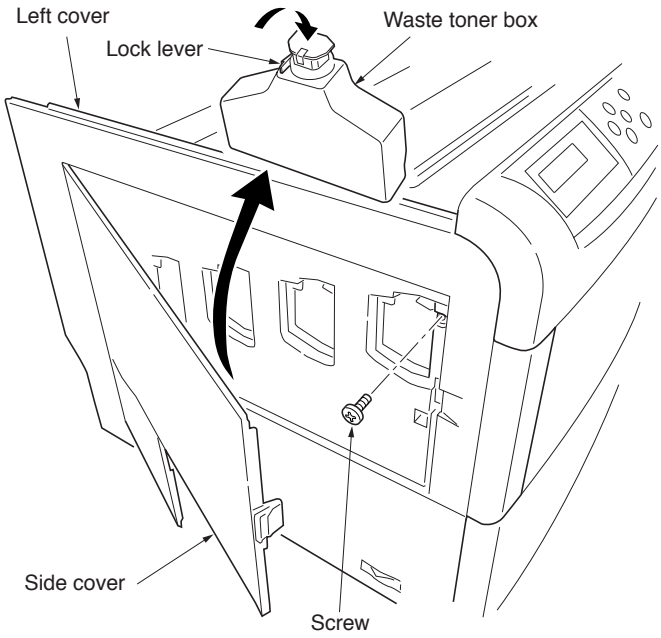


Figure 1-6-5

4. Remove the paper feed unit (see page 1-6-5).
5. Using a flat blade screwdriver, unlatch the right cover at the nine positions as shown in the diagram.

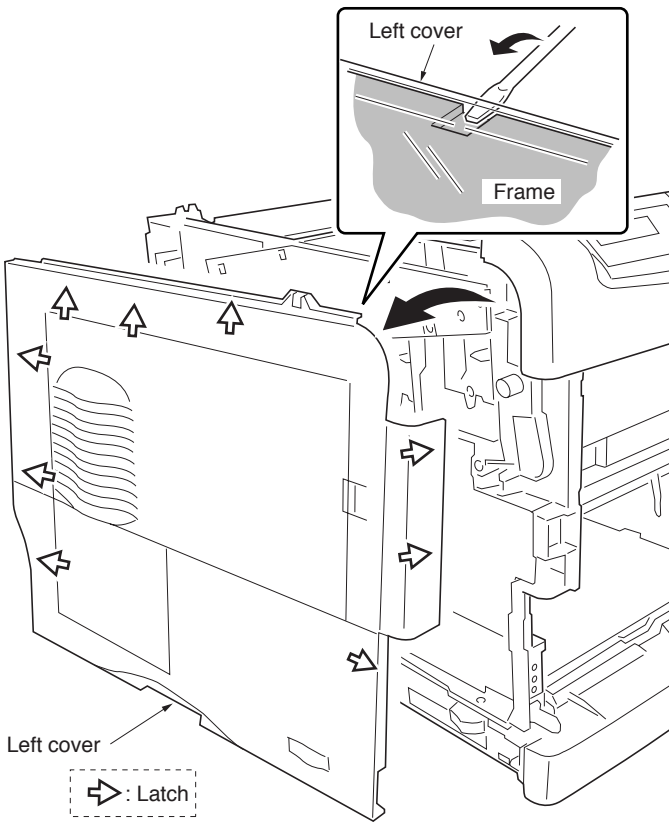


Figure 1-6-6

1-6-3 Paper feed unit

(1) Detaching and refitting the paper feed unit

Procedure

1. Pull out the paper feed unit until stop.
2. While pressing the left and right lock release buttons and then remove the paper feed unit.

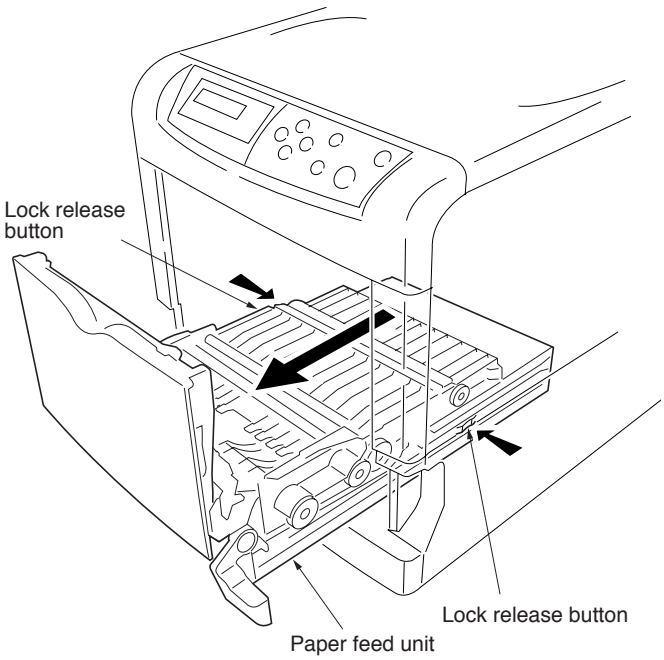


Figure 1-6-7

(2) Detaching and refitting the paper feed roller

Procedure

1. Remove the paper feed unit (see previous page).
2. Turn over the paper feed unit.
3. While pushing the lock release buttons and then detach the joint.
4. Unlatch the latches and then remove paper feed roller unit.

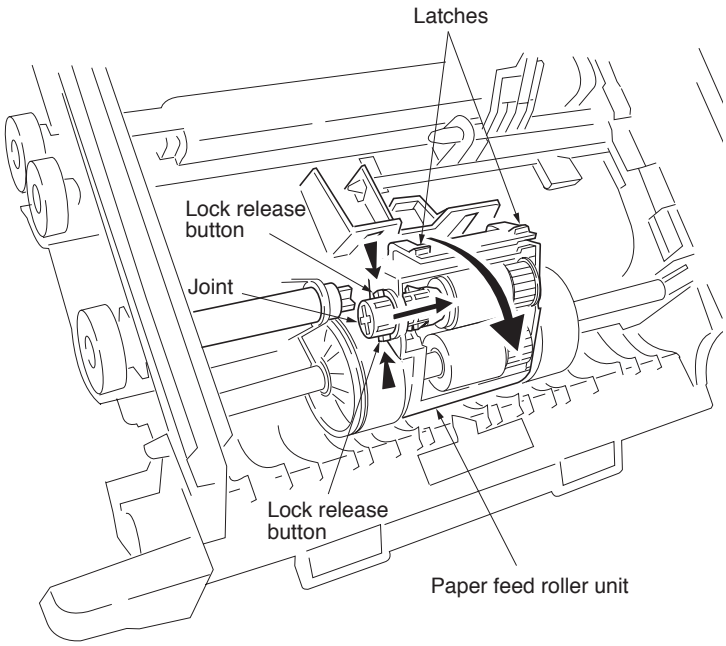


Figure 1-6-8

5. Unlatch the three latches and then remove the feed bracket cover.
6. Remove the feed roller and pickup roller.
   • The one-way clutch is built in to the pickup gear Z32S. When the pickup gear Z32S is installed again, the surface of one-way clutch side is directed to feed bracket cover side.
7. Check or replace the feed roller and then refit all the removed parts.

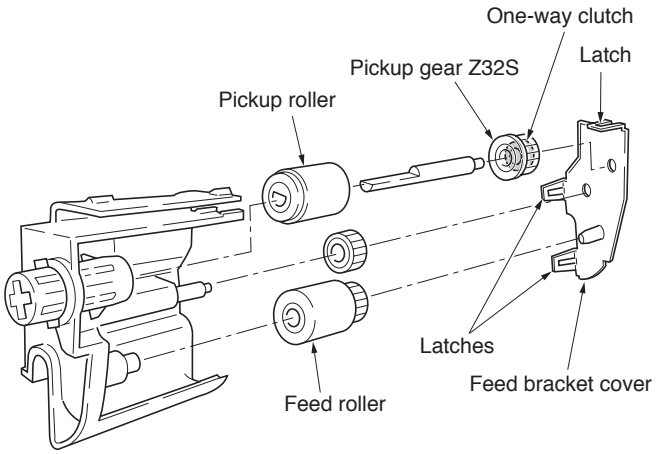


Figure 1-6-9

(3) Detaching and refitting the retard roller

Procedure

1. Remove the paper cassette.
2. Unlatch the two latches and then remove the retard roller holder.
3. Remove the retard roller from retard roller holder.
4. Check or replace the retard roller and then refit all the removed parts.

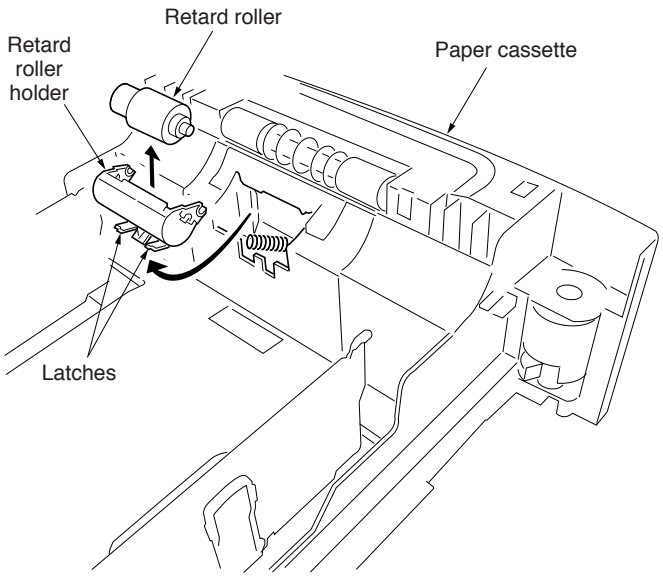


Figure 1-6-10

(4) Detaching and refitting the secondary transfer roller

Procedure

1. Remove the paper feed unit (see page 1-6-5).
2. Removing the hook by sliding and then remove the paper chute.
3. Remove the secondary transfer roller.
4. Remove the transfer roller gear.
5. Check or replace the secondary transfer roller and then refit all the removed parts.

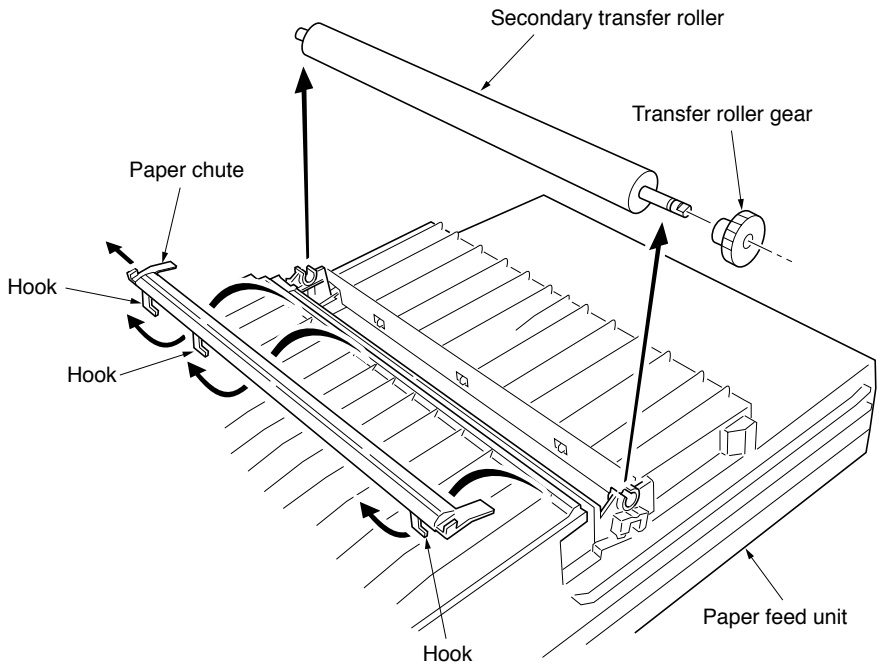


Figure 1-6-11

1-6-4 MP tray feed unit

(1) Detaching and refitting the MP tray feed unit

Procedure

1. Remove the paper feed unit (see page 1-6-5).
2. Remove the paper right cover (see page 1-6-3).
3. Remove the main high voltage PWB (see page 1-6-29).
4. Remove the paper feed drive unit (see page 1-6-32).
5. While pushing the latch from inside the main unit frame and then remove the MP tray feed unit.
6. Check or replace the MP tray feed unit and then refit all the removed parts.

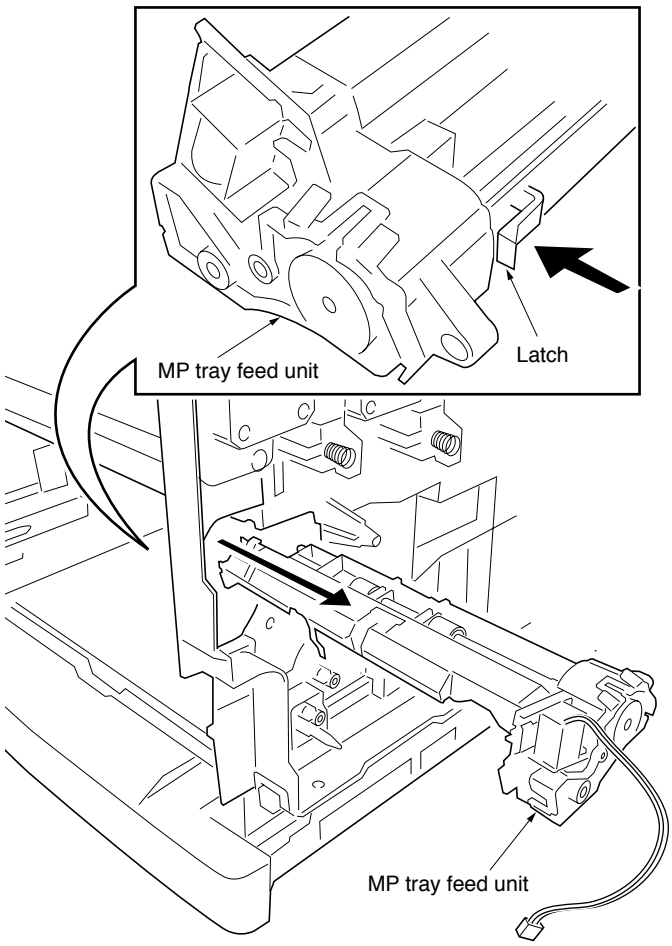


Figure 1-6-12

(2) Detaching and refitting the MP tray feed roller

Procedure

1. Remove the MP tray feed unit (see previous page).
2. Pull up the MP tray holder and then sliding do.
3. Remove the MP tray feed roller.
4. Check or replace the MP tray feed roller and then refit all the removed parts.

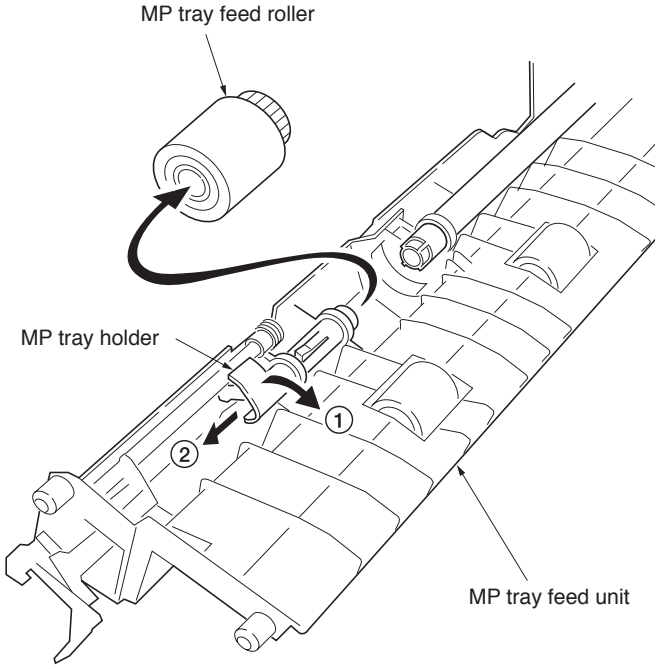


Figure 1-6-13

1-6-5 Developing section

(1) Detaching and refitting the developer unit

Procedure

1. Open the top cover.
2. Remove the one connector.
3. While releasing two release levers and then remove the developer unit. (Use the same procedure for other developers.)

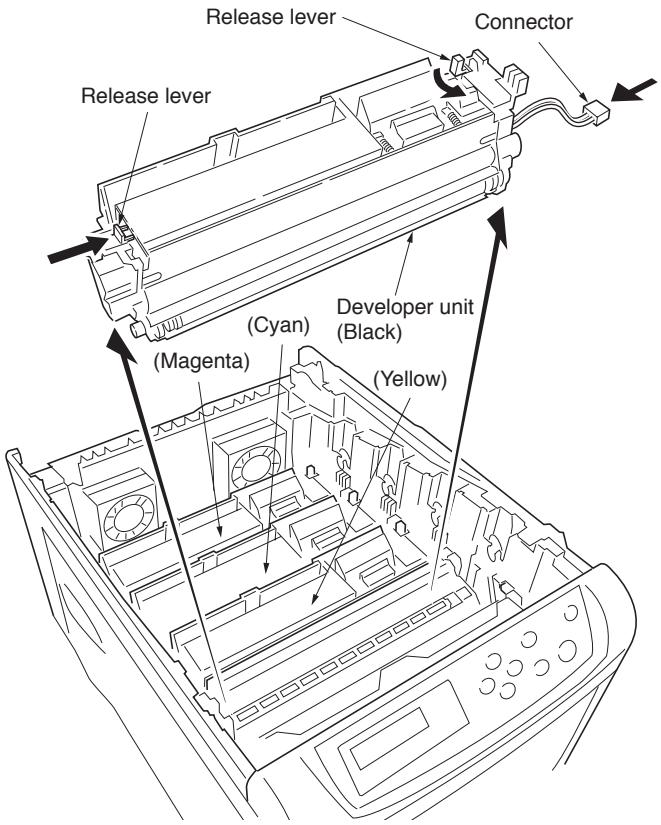


Figure 1-6-14

1-6-6 Drum section

(1) Detaching and refitting the drum unit

Procedure

1. Remove the developer unit (see previous page).
2. Remove the each connector cover.

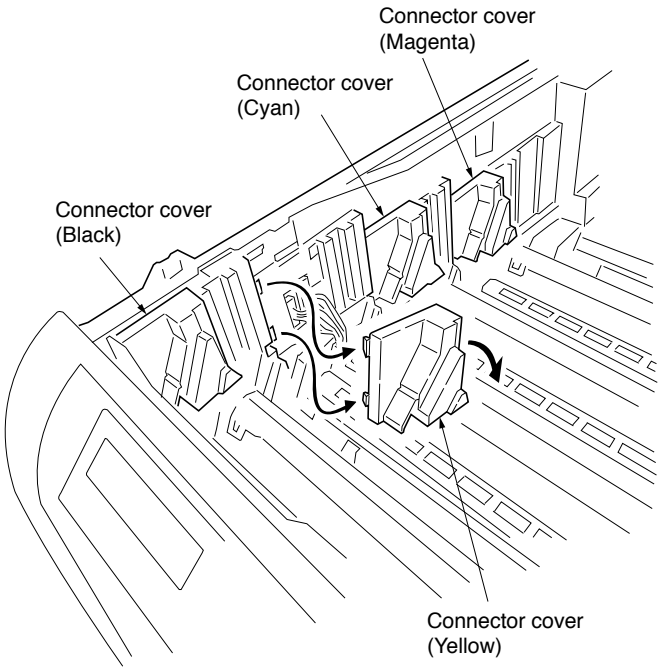


Figure 1-6-15

3. Remove the two connectors.
4. While releasing two release levers and then remove the drum unit. (also 4 colors with the same procedure, there is no order.)

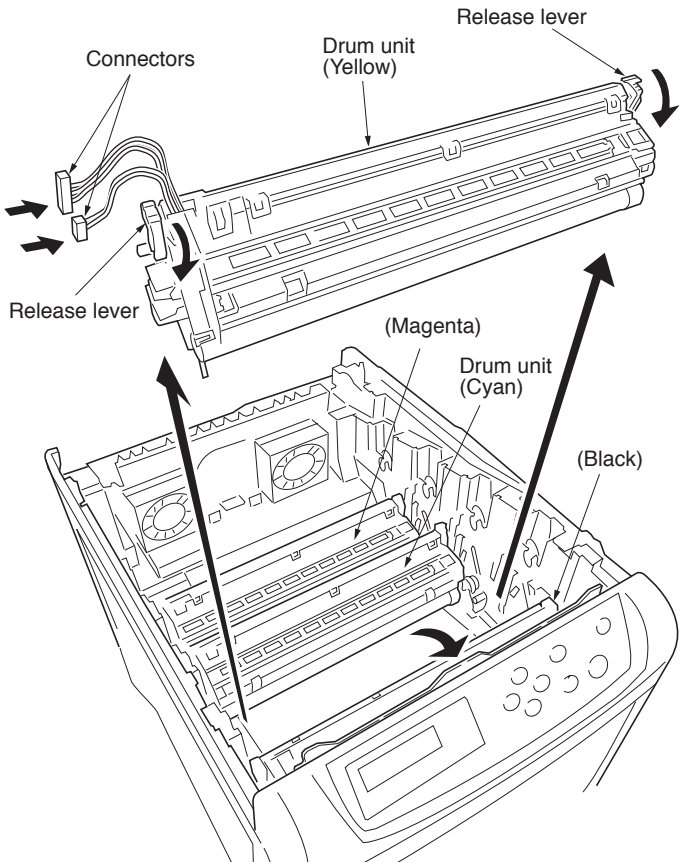


Figure 1-6-16

(2) Detaching and refitting the LED print heads

Procedure

1. Remove the drum unit (see previous page).
2. Remove the hook and the opening and closing axis and then remove the LED print head cover.
   - Before removing the LED print head, sufficiently do to let escape the static electricity which is electrified in the human body concerning the metal part and the like of the aqueduct faucet, after that do that work.
3. Remove the LED print head.
   - Do not attempt turn the focal adjustment pins).
   - At the time of handling, have the metal based part the both ends, do not touch the SELFOC lens part.
4. Remove the four connectors and then remove the harness.
5. Check or replace the LED print head and then refit all the removed parts.
   - When replacing to the new LED print head, peel the protection seal (blue color) of the SELFOC lens.

Caution

- When refitting the LED print head in the drum unit, make sure that the print head is properly seated in the drum unit.

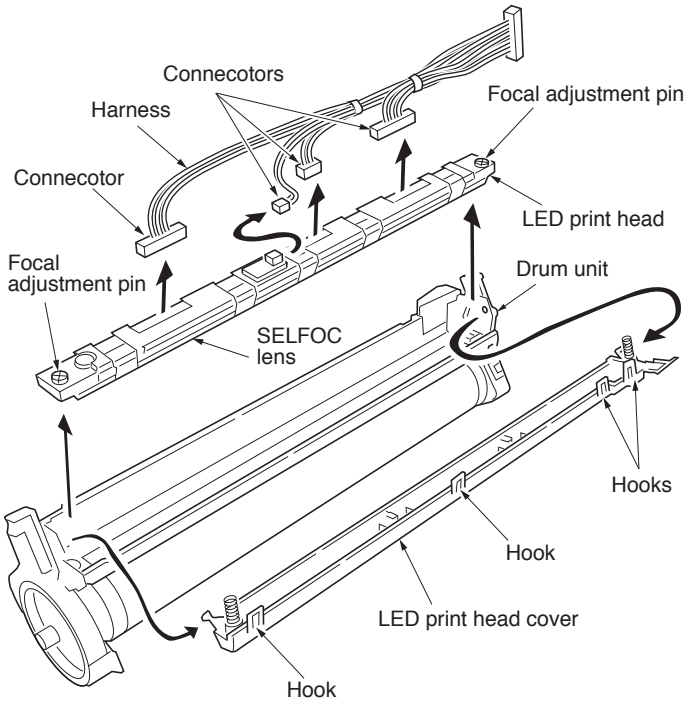


Figure 1-6-17

6. Print the test print, and check the image.
   - After replacing to the new LED print head, when making the printer restart, in order again to read the LED compensation data from the LED print head memory PWB, time of 30 seconds is required.

1-6-7 Primary transfer section

(1) Detaching and refitting the primary transfer unit

Procedure

1. Remove the all drum units (see page 1-6-12).
2. Pull two handles and raise.
3. Remove the primary transfer unit with the handles.
4. Check or replace the primary transfer unit and then refit all the removed parts.

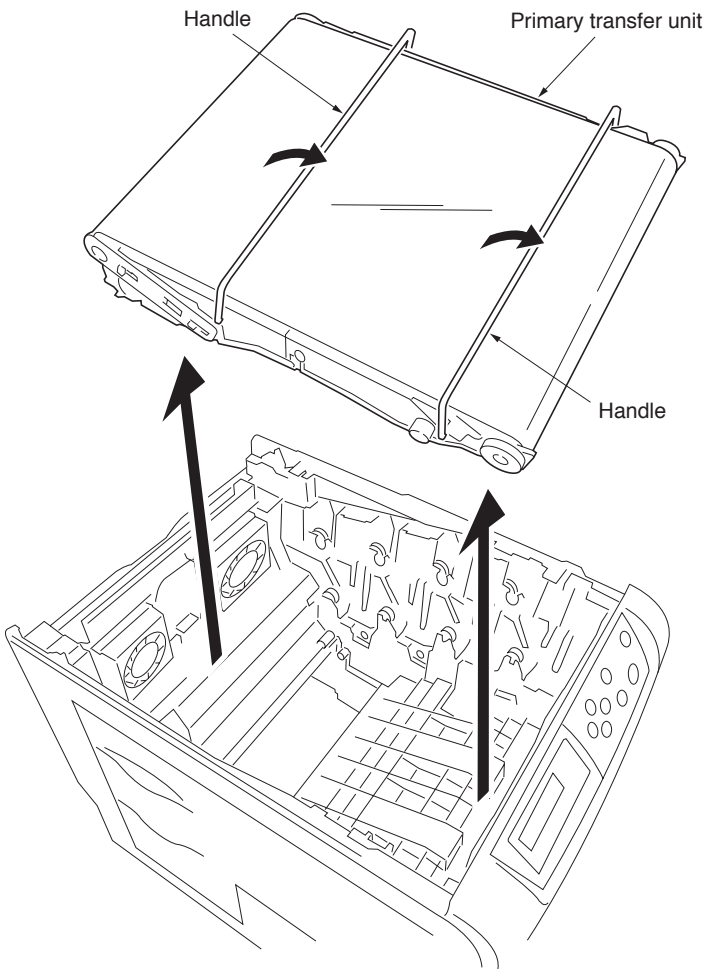


Figure 1-6-18

(2) Detaching and refitting the primary transfer belt

Procedure

1. Remove primary transfer unit (see previous page).
2. Remove the two handles.
3. Remove the two screws and then make the primary transfer unit two-fold.
4. Remove the primary transfer belt.
5. Check or replace the primary transfer belt and then refit all the removed parts.

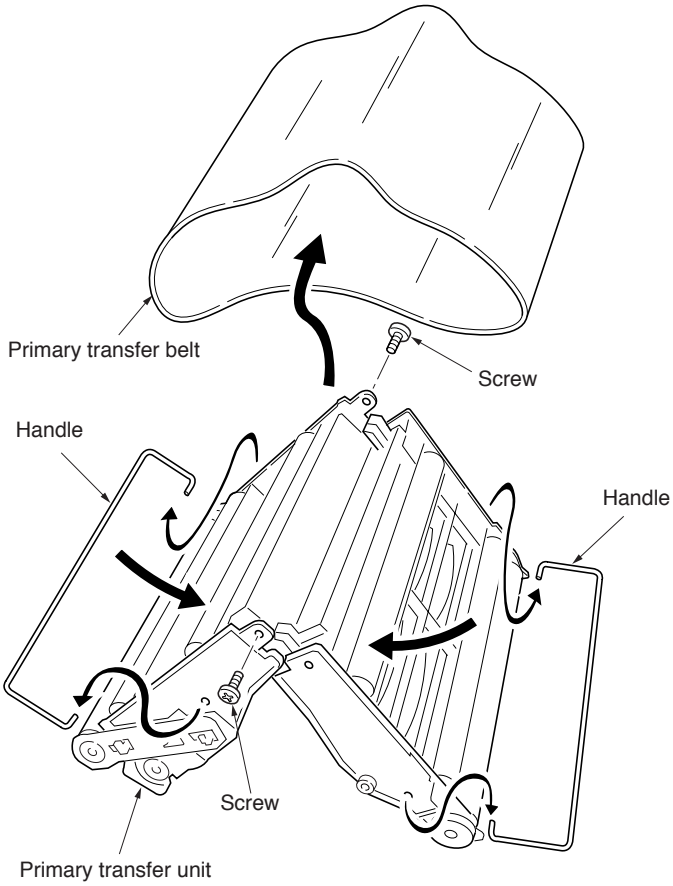


Figure 1-6-19

(3) Detaching and refitting the primary transfer cleaning unit

Procedure

1. Remove the primary transfer unit (see page 1-6-14).
2. Pull out the primary transfer cleaning unit from the main unit frame a little with underneath the right ①.
3. Pull out the waste toner outlet ② which is on the left side of the primary transfer cleaing unit from the main unit frame.
4. Remove the primary transfer cleaning unit.
5. Check or replace the primary transfer cleaning unit and then refit all the removed parts.

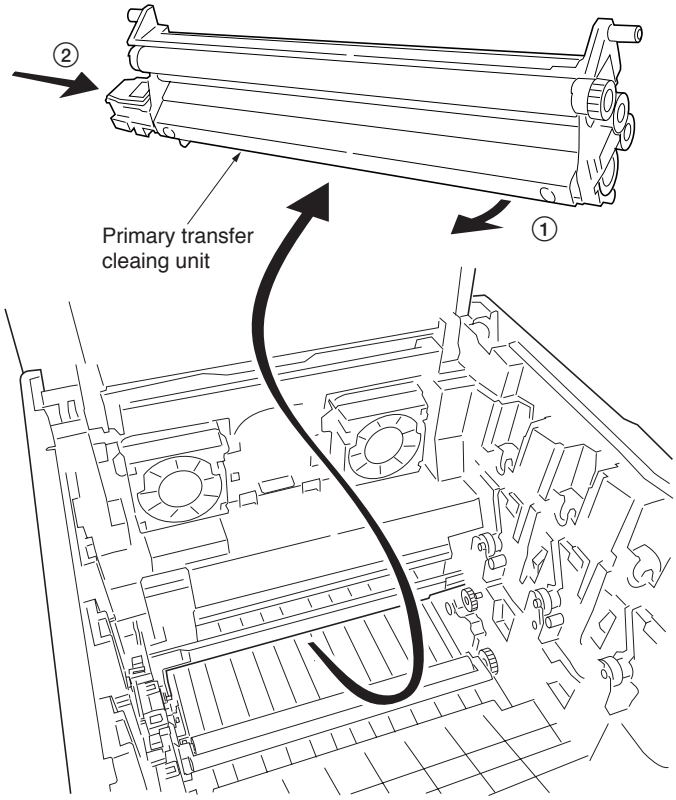


Figure 1-6-20

1-6-8 Fuser unit

(1) Detaching and refitting the fuser unit

Procedure

1. Remove the rear cover (see page 1-6-2).
2. Remove the right cover and left cover (see pages 1-6-4, 5).
3. Remove the two screws and then remove the fuser unit.
4. Check or replace the fuser unit and then refit all the removed parts.

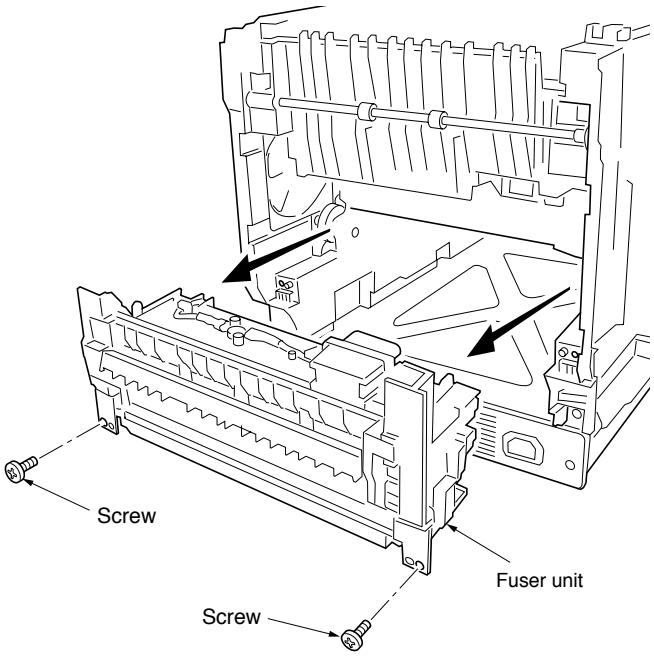


Figure 1-6-21

(2) Detaching and refitting the fuser thermistor 1 and 2, fuser thermostat 1 and 2, fuser heater lamp 1 and 2, heat roller, and press roller

Procedure

1. Remove the fuser unit (see previous page).
2. While two latch unlatching, remove the fuser bottom cover by making slide.
3. Remove the one tab.

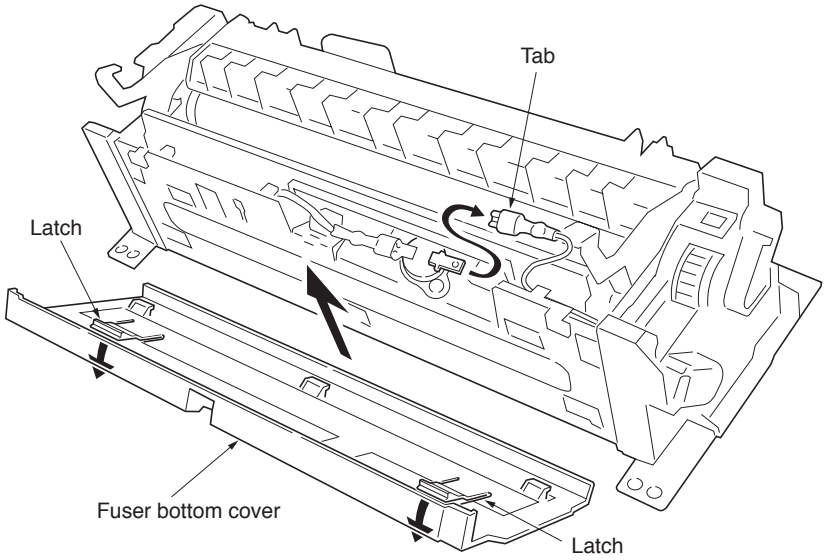


Figure 1-6-22

4. Remove the two screws form the terminal.

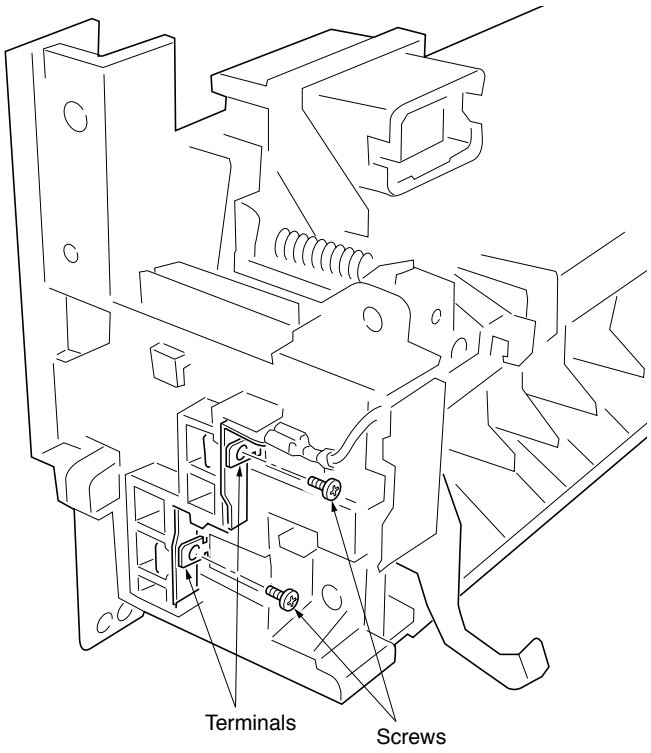


Figure 1-6-23

5. Remove the three connectors from the fuser PWB.
6. Remove the one tab.
7. While unlatching the latches and then remove the fuse unit connector.
8. Remove the terminal.

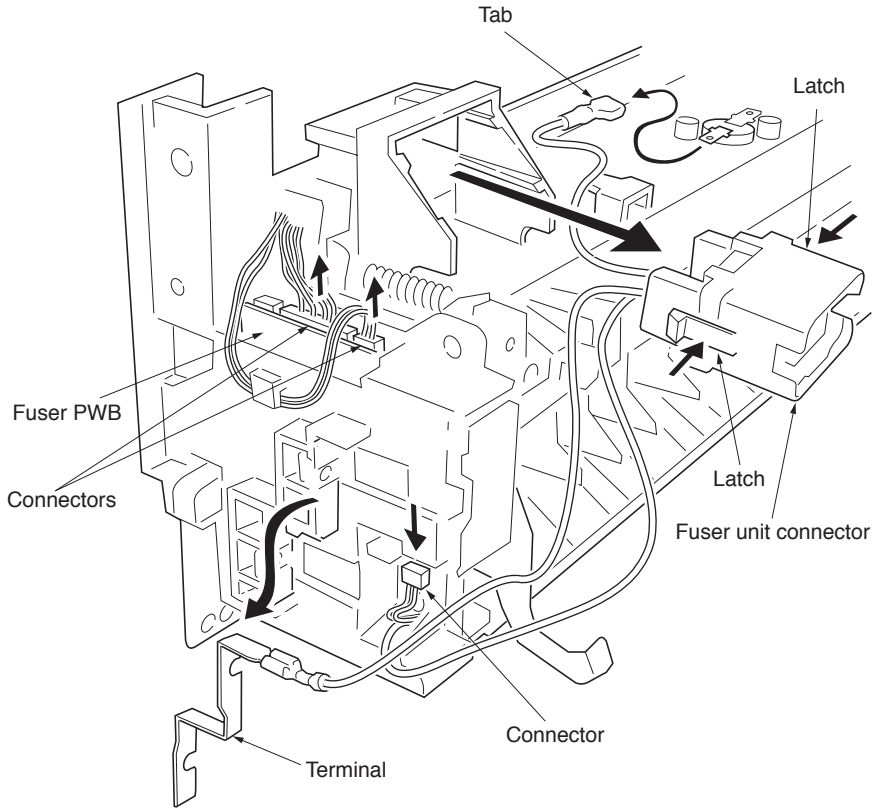


Figure 1-6-24

9. Remove the one screw and then remove the fuser left cover.

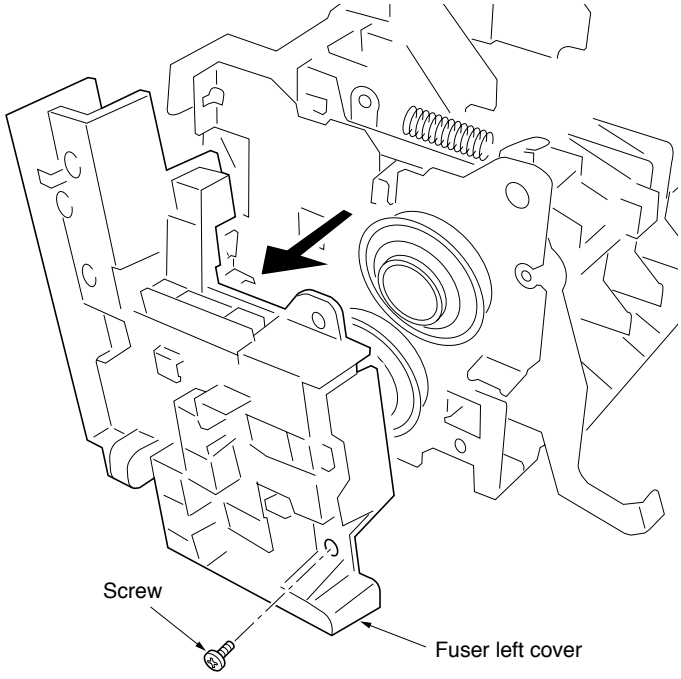


Figure 1-6-25

10. Remove the one screw and then remove the fuser right cover.
11. Remove the fuser heater lamp 1 and 2.

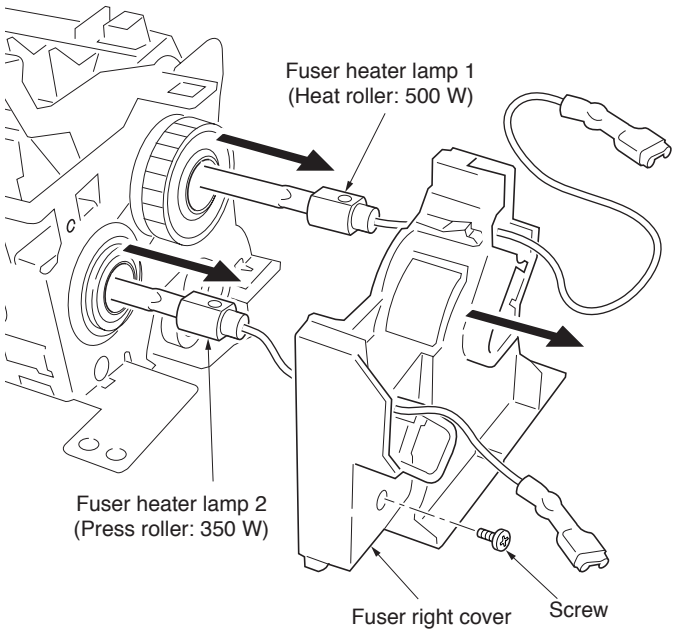


Figure 1-6-26

12. Remove the two pressure springs.
13. Remove the fuser upper cover, right pressure lever and, left pressure lever.
14. Remove the fuser stay.

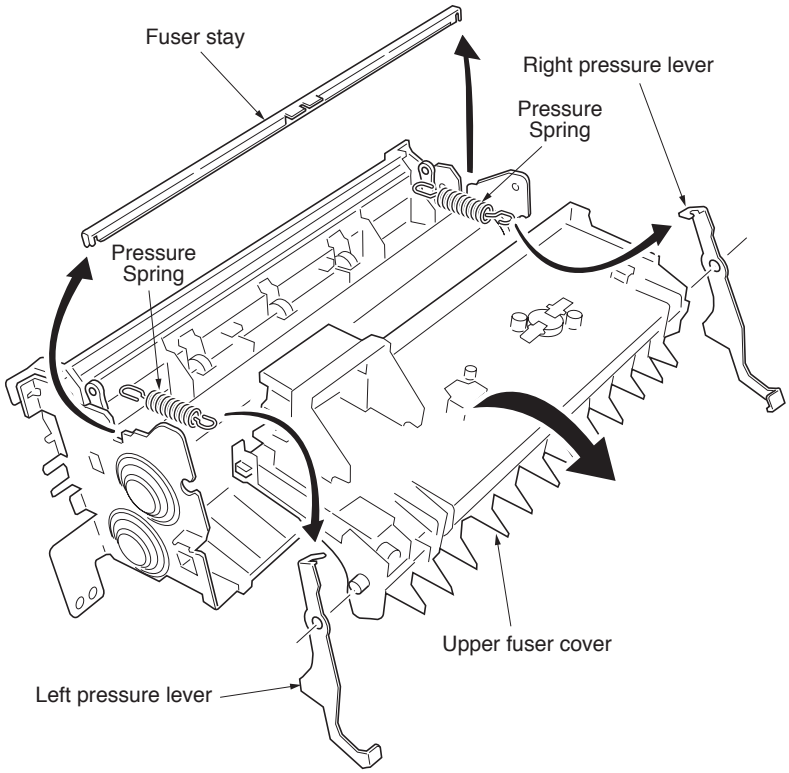


Figure 1-6-27

15. Remove the two screws and then remove the fuser thermostat 1.
16. Remove the one screw and then remove the fuser thermistor 1.

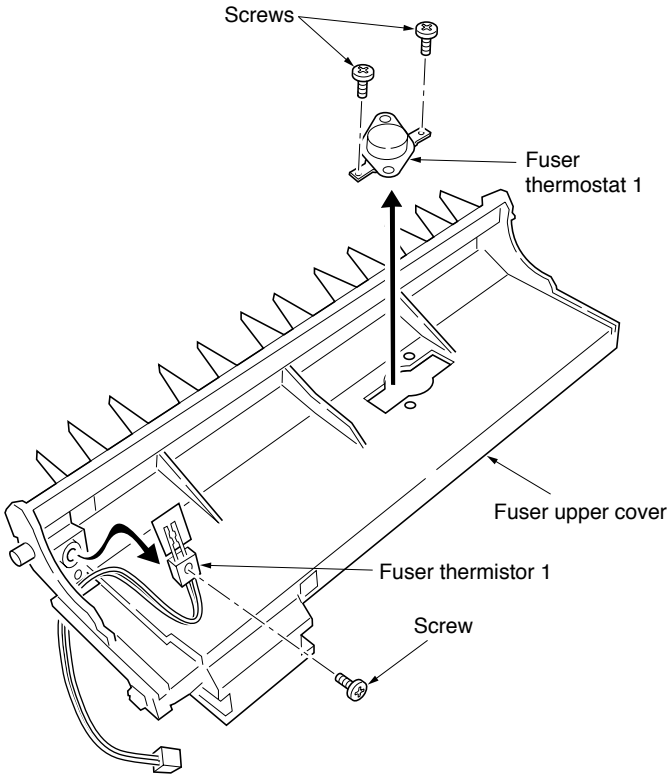


Figure 1-6-28

17. Remove the user lower guide.
18. Remove the one tab.
19. Remove the two screws and then remove the fuser thermostat 2.
20. Remove the one screw and then remove the fuser thermistor 2.

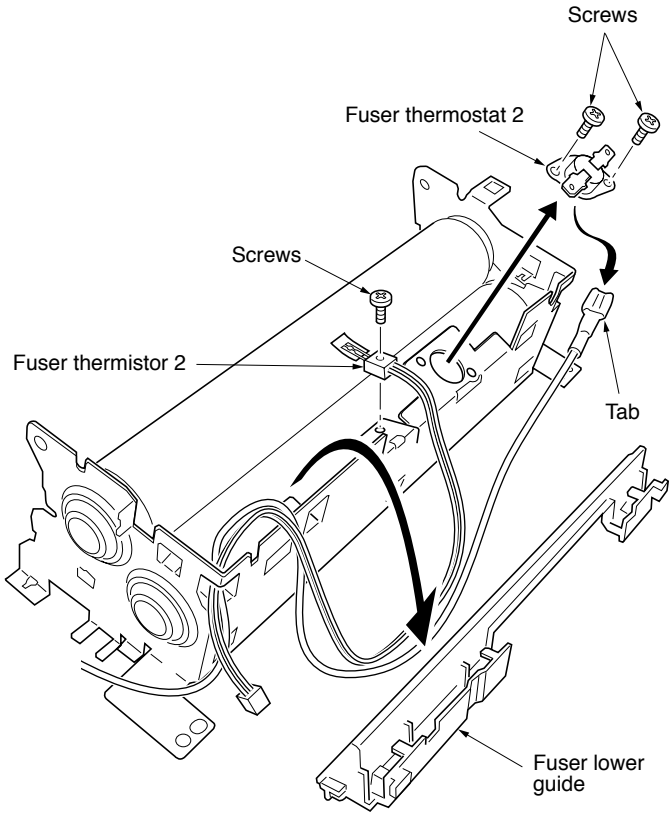


Figure 1-6-29

21. Remove the one C-ring, fuser gear, one C-ring, one bush and, one bearing.
22. Remove the one C-ring, one bush and, one bearing.
23. Remove the heat roller.

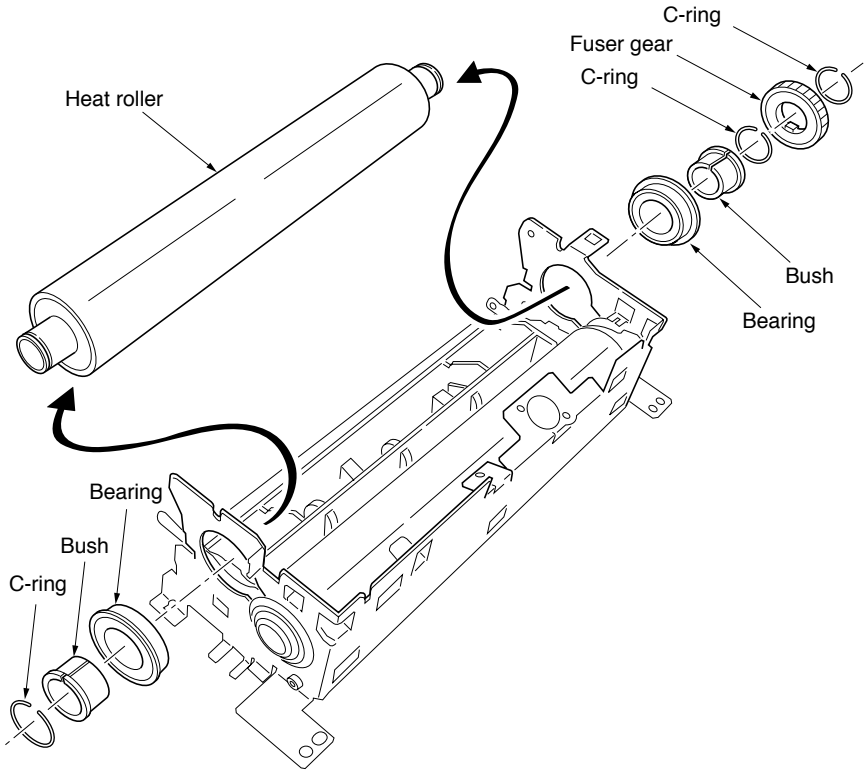


Figure 1-6-30

24. Remove the two bushes and two bearings.
25. Remove the right stay, left stay and press roller.
26. Check or replace the fuser thermistor 1 and 2, fuser thermostat 1 and 2, fuser heater lamp 1 and 2, heat roller and, press roller then refit all the removed parts.

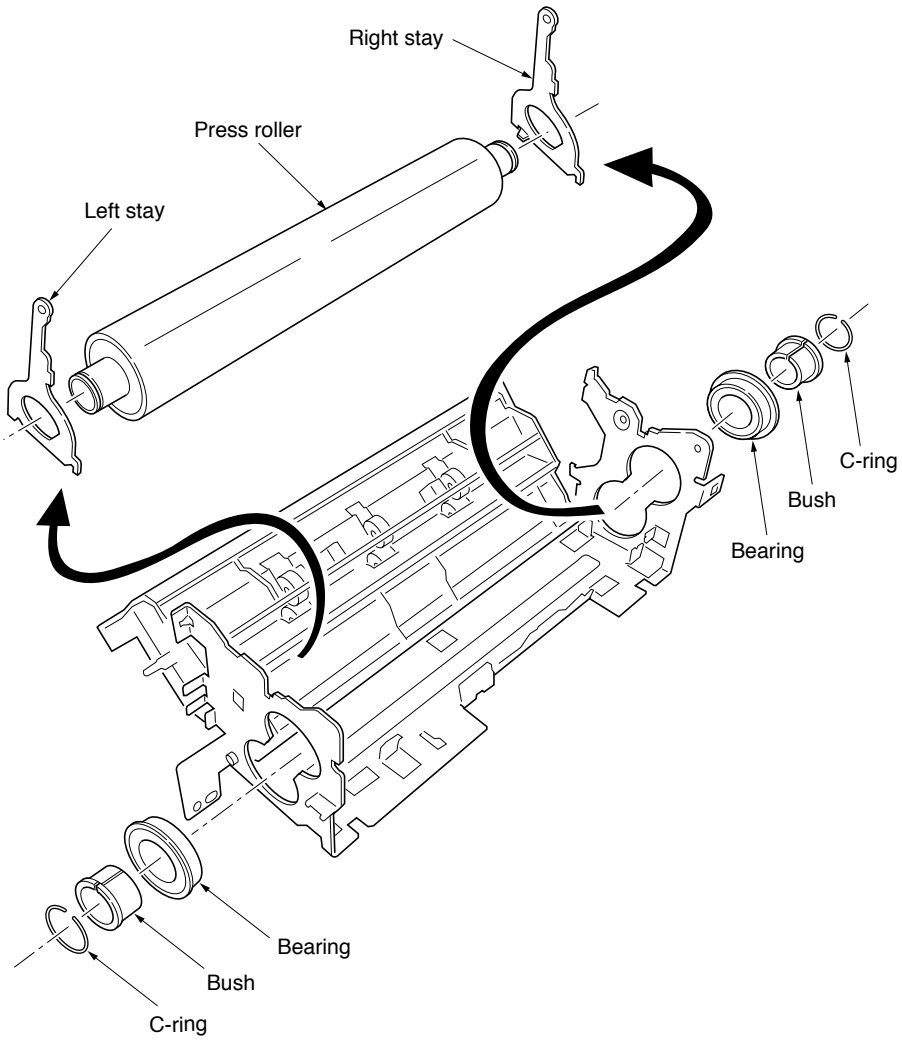


Figure 1-6-31

1-6-9 PWBs

(1) Detaching and refitting the main controller PWB

Procedure

1. Turn off the power switch and then remove the power cord.
2. When the optional memory card has been installed in the Memory card slot already, remove that.
3. Remove the two screws and then remove the main controller PWB.

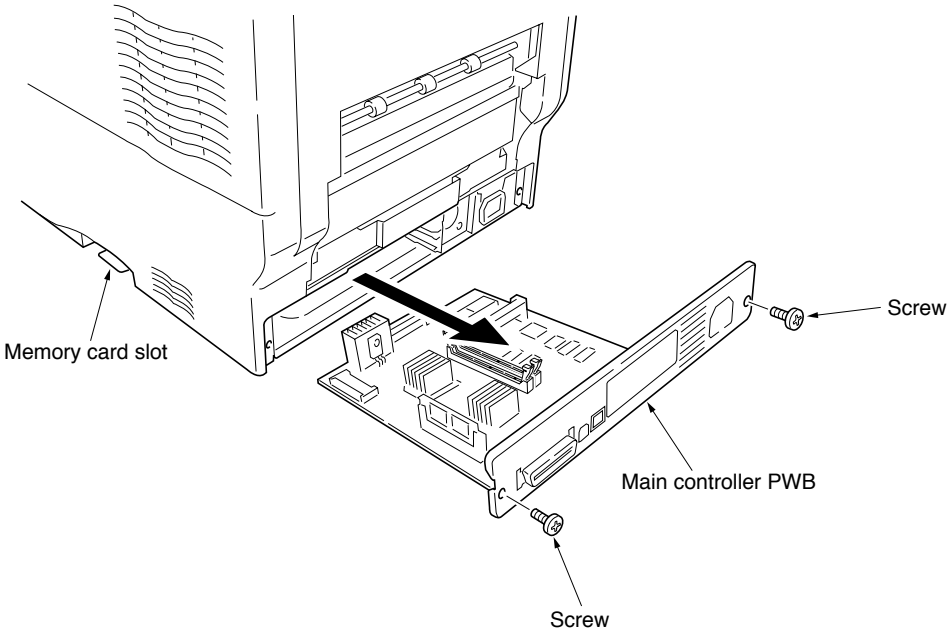


Figure 1-6-32

(2) Detaching and refitting the engine controller PWB and power supply PWB

Procedure

1. Remove the main controller PWB (see previous page).
2. Remove the right cover, left cover and, rear cover. (see pages 1-6-2, 3, 4).
3. Remove the all (machine left: five, machine right: four) connectors.

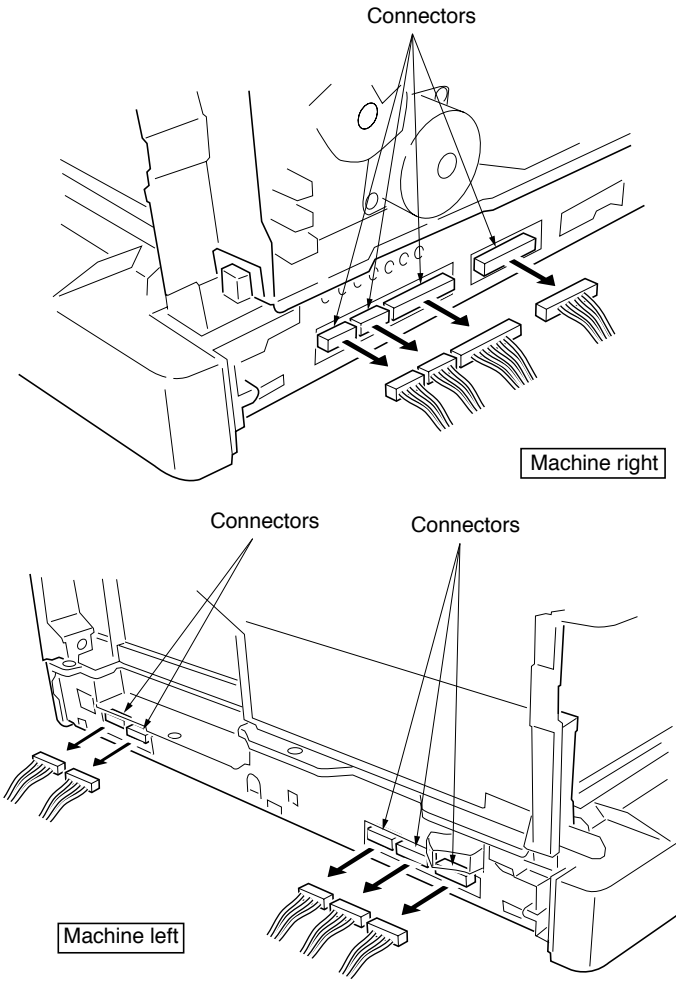


Figure 1-6-33

4. Remove three screws.
5. Loose the one screw.
6. Remove the main unit frontal projections and remove the controller box.

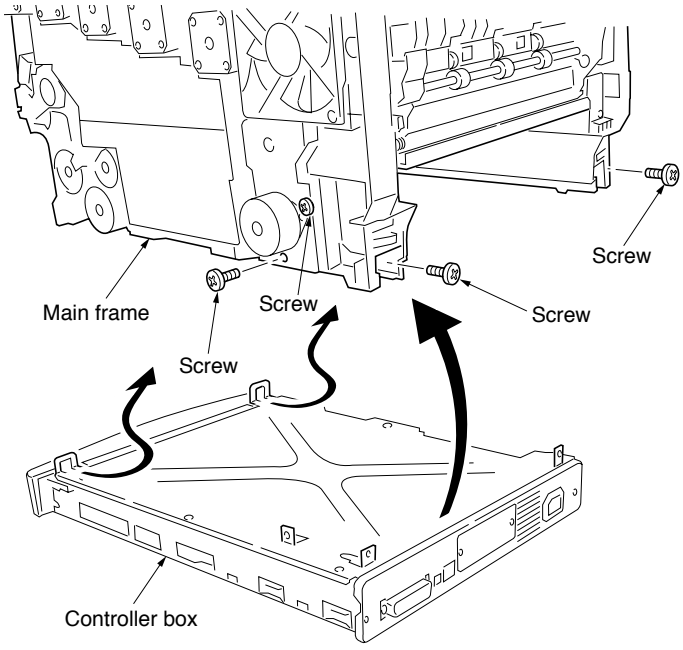


Figure 1-6-34

7. Remove the six screws and then remove the controller box cover.

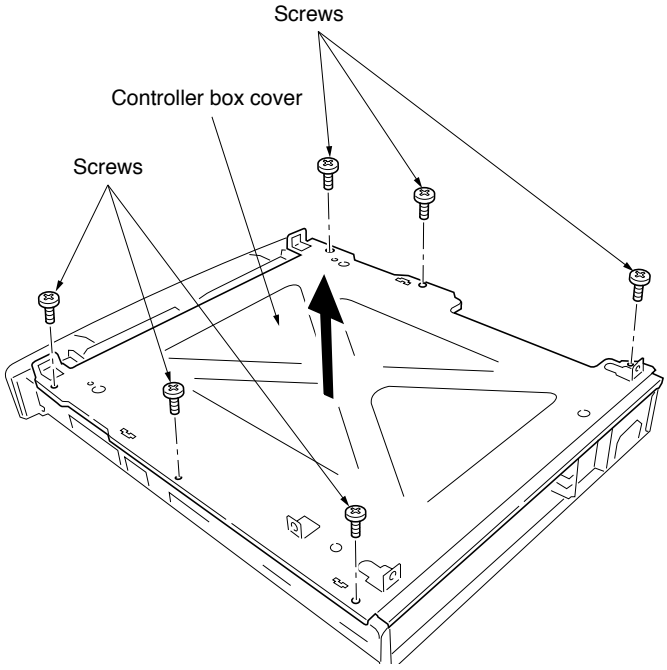


Figure 1-6-35

8. Remove the five screws.
9. Remove the two connectors and then removing the connection with the power supply PWB, remove the engine controller PWB.

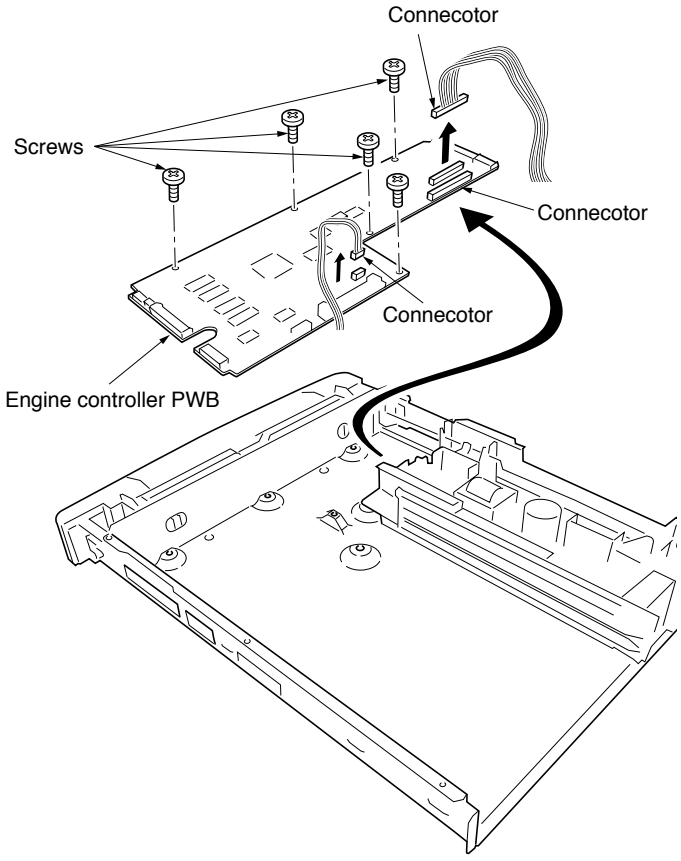


Figure 1-6-36

10. The EEPROM (U12) removing from the socket of the old engine controller PWB, it does again to install in the socket of the new engine controller PWB.

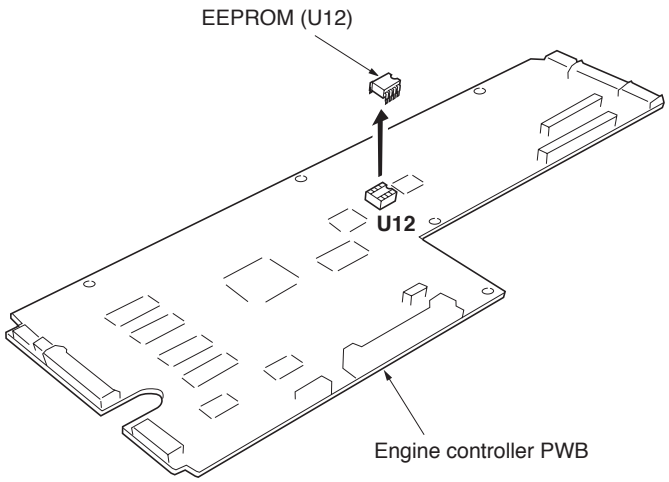


Figure 1-6-37

11. Remove the three screws, one terminal, one washer and then remove the power supply PWB.
12. Check or replace the engine controller PWB and power supply PWB then refit all the removed parts.

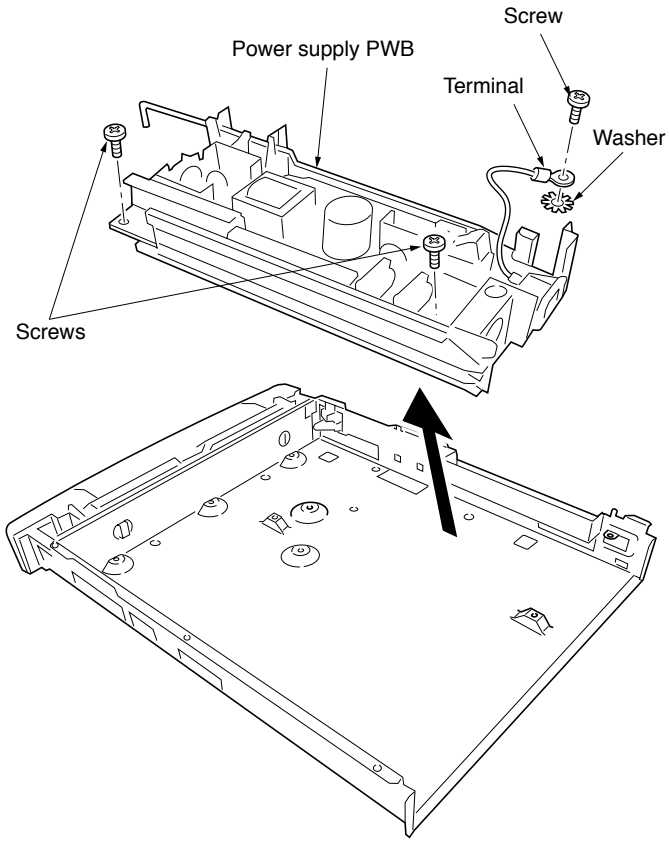


Figure 1-6-38

(3) Detaching and refitting the LED print heads relay PWB

Procedure

1. Remove the left cover (see page 1-6-4).
2. Unlatch the four latches and remove the two connectors and then remove the LED print heads relay PWB.
3. Check or replace the LED print heads relay PWB and then refit all the removed parts.

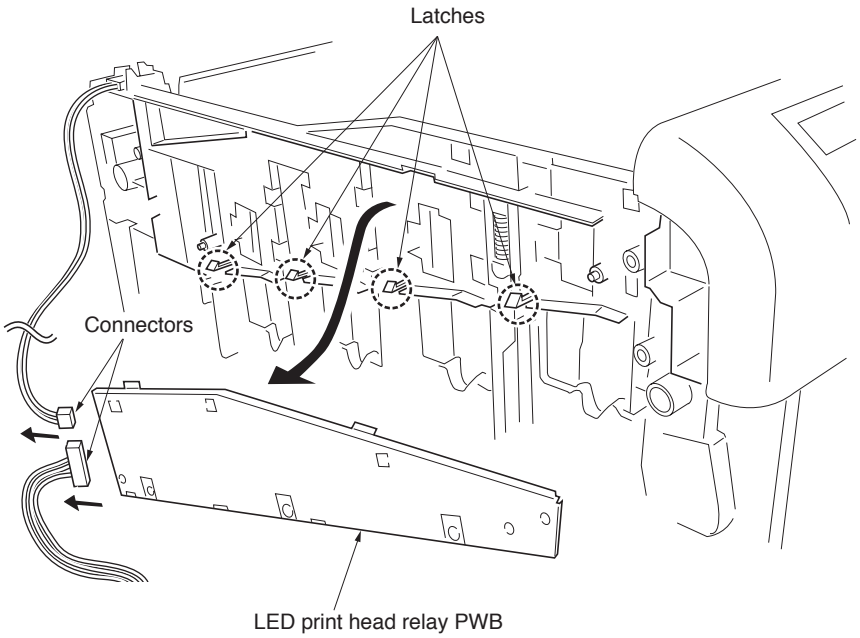


Figure 1-6-39

(4) Detaching and refitting the main high voltage PWB

Procedure

1. Remove the right cover (see page 1-6-3).
2. Unlatch the four latches and remove the one connector and then remove the main high voltage PWB.
3. Check or replace the main high voltage PWB and then refit all the removed parts.

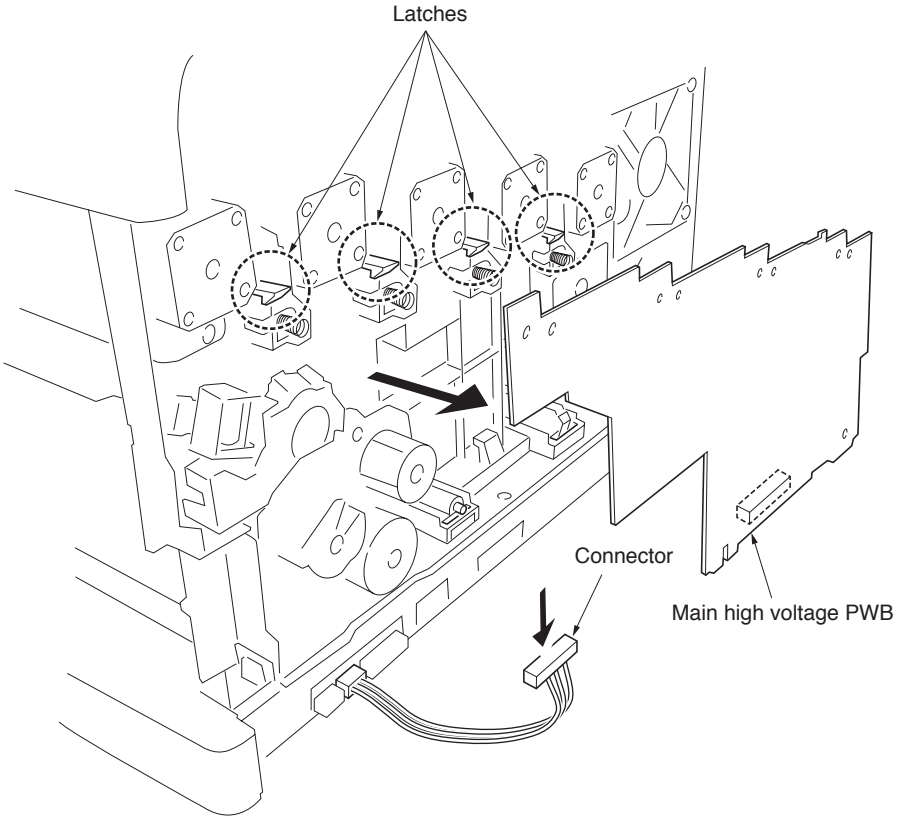


Figure 1-6-40

(5) Detaching and refitting the bias high voltage PWB

Procedure

1. Remove the right cover (see page 1-6-3).
2. Unlatch the five latches and remove the two connectors and then remove the bias high voltage PWB.
3. Check or replace the bias high voltage PWB and then refit all the removed parts.

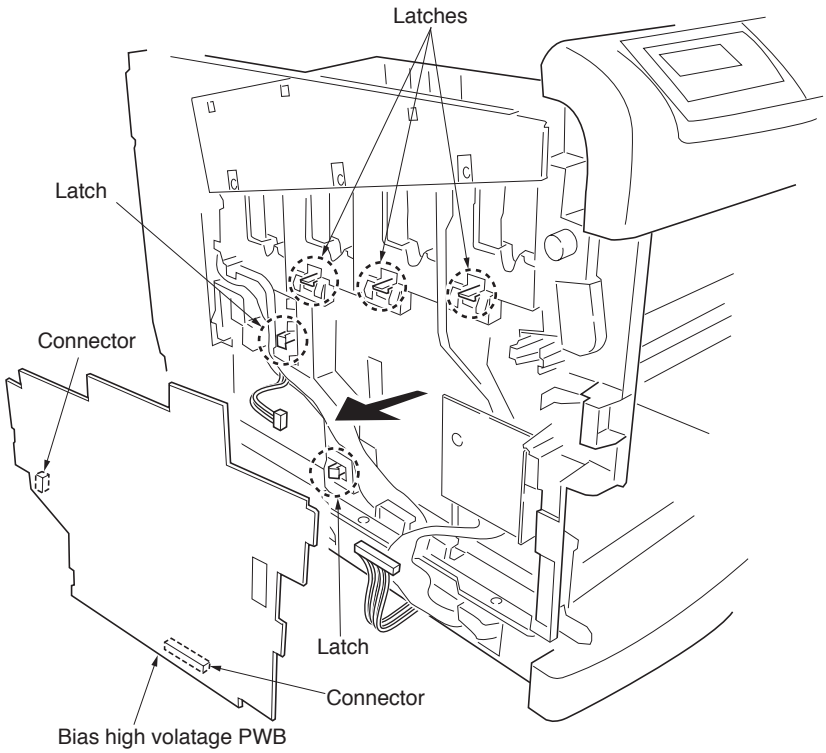


Figure 1-6-41

1-6-10 Others

(1) Detaching and refitting the main drive unit

Procedure

1. Remove the right cover (see page 1-6-3).
2. Remove the seven connectors.
3. Remove the six screws and then remove the main drive unit.
4. Check or replace the main drive unit and then refit all the removed parts.

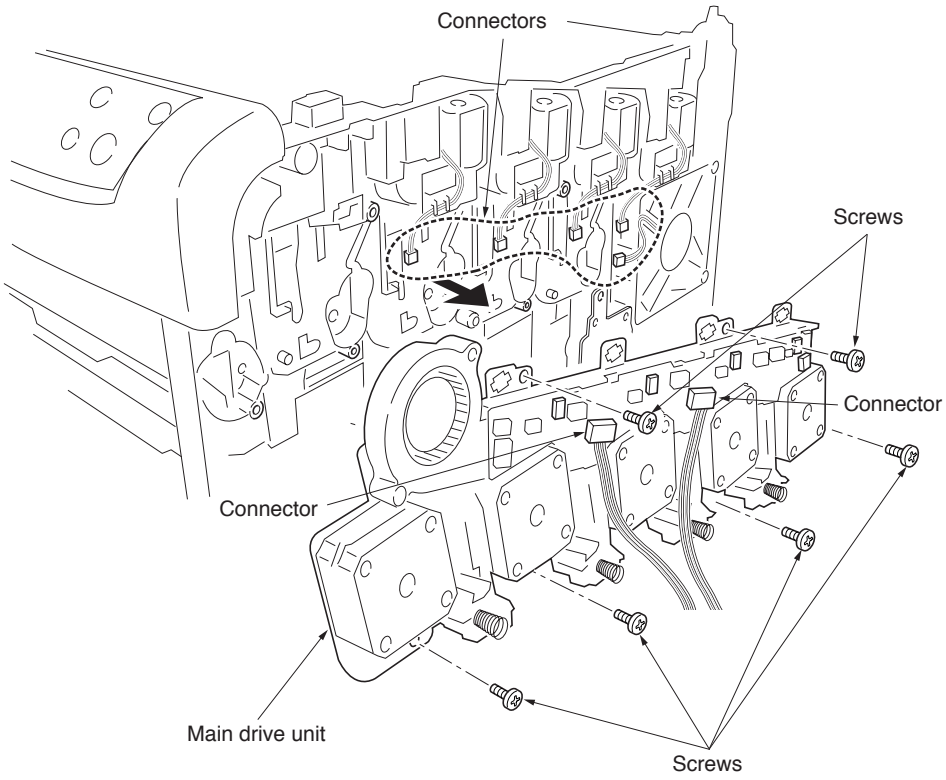


Figure 1-6-42

(2) Detaching and refitting the paper feed drive unit

Procedure

1. Remove the right cover (see page 1-6-3).
2. Remove five connectors.
3. Remove the harness from the two wire hooks.

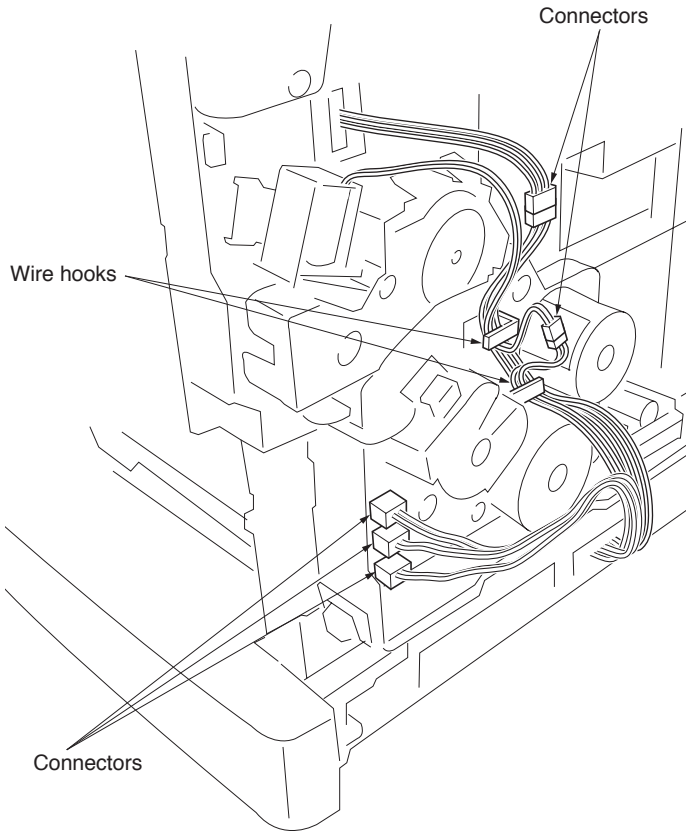


Figure 1-6-43

4. Remove the three screws and then remove the paper feed drive unit.
5. Check or replace the paper feed drive unit and then refit all the removed parts.

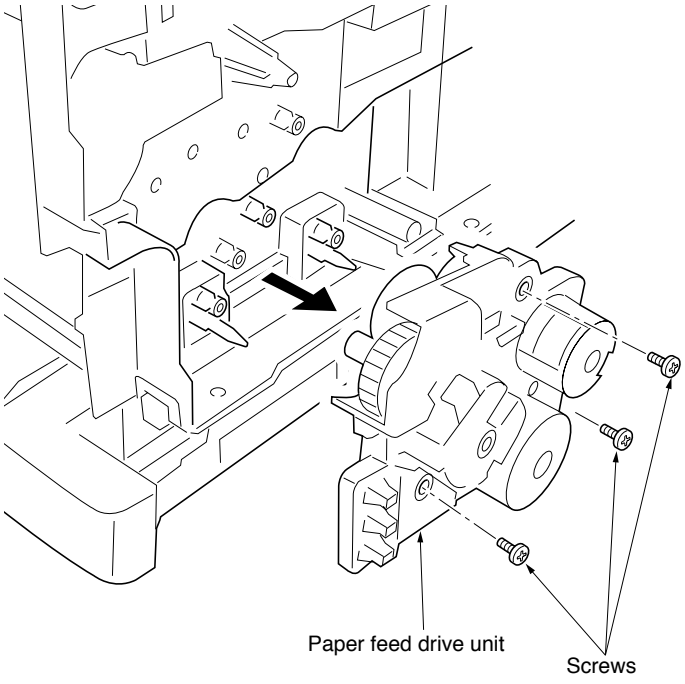


Figure 1-6-44

(3) Detaching and refitting the fuser drive unit

Procedure

1. Remove the right cover (see page 1-6-3).
2. Remove the one connector.
3. Remove the two screws and the remove the fuser drive unit.
4. Check or replace the fuser drive unit and then refit all the removed parts.

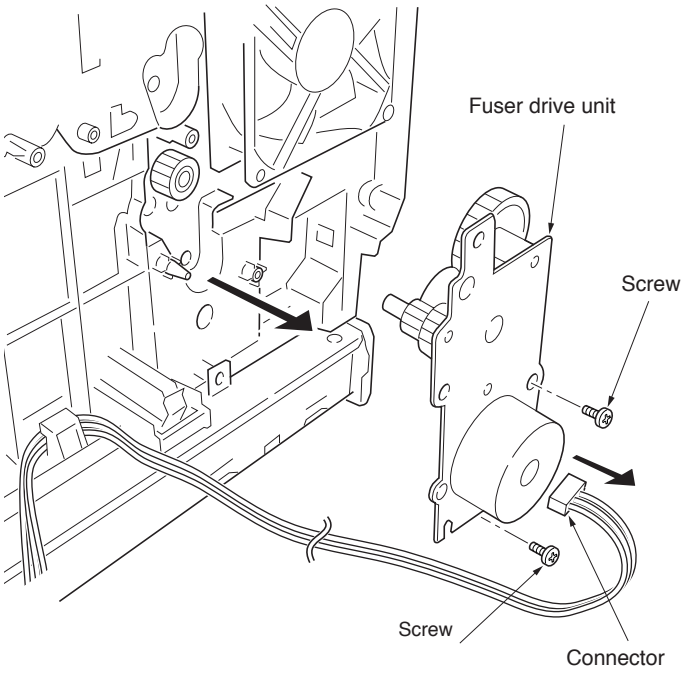


Figure 1-6-45

(4) Detaching and refitting the toner motor 1, 2, 3 and 4

Procedure

1. Remove the right cover (see page 1-6-3).
2. Remove the one connector.
3. Remove the hole which is inserted into the projection of main unit frame side, slide toner motor 4 to up in order to remove the hook.
4. Remove the toner motor 4.
5. Check or replace the toner motor 4 and then refit all the removed parts. (Also four toner motors with the same procedure, there is no order.)

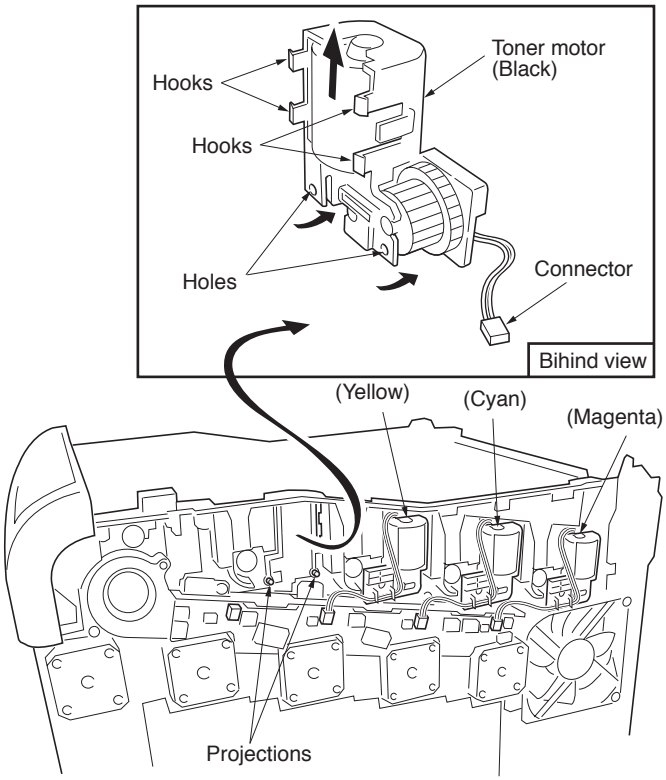


Figure 1-6-46

(5) Detaching and refitting the ozone filters

Procedure

1. Open the top cover.
2. Remove the ozone filters from the ozone fan motor 1 and 2.
3. Check or replace the ozone filters and then refit all the removed parts.

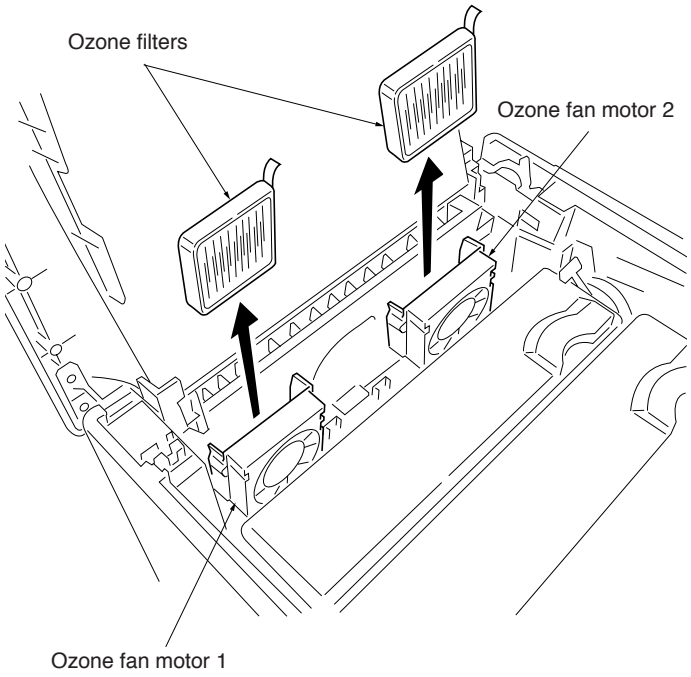


Figure 1-6-47

(6) Detaching and refitting the waste toner duct

Procedure

1. Remove the primary transfer unit (see page 1-6-15).
2. Unlatch the three latches and then remove the waste toner duct.
3. Check or replace the waste toner duct and then refit all the removed parts.

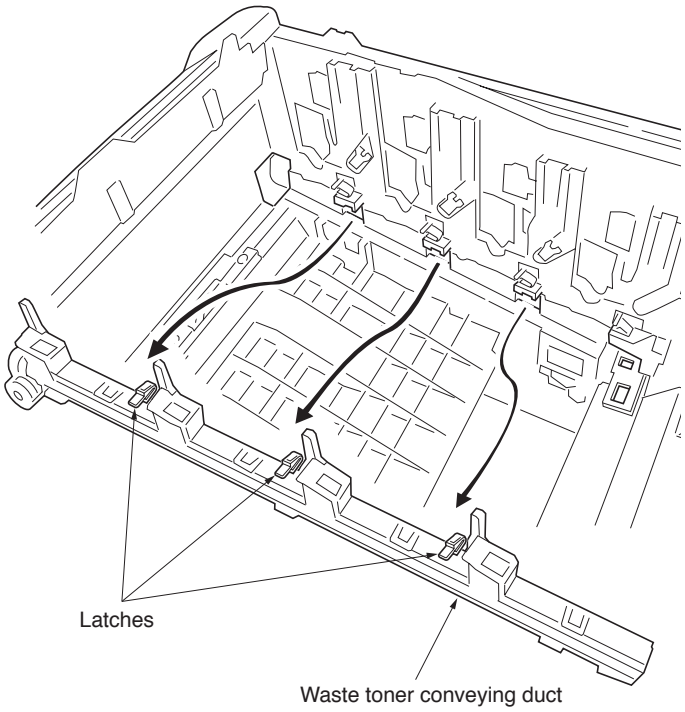


Figure 1-6-48

1-7-1 Downloading firmware

The system firmware can be update by downloading new firmware. Downloading can be made either by directly sending the new firmware from PC via the parallel interface or using a memory card that contains the new firmware. The message data for the operation panel display is also downloadable so that a new message language is appended for the operation panel. The message data should be downloaded directly from PC.

(1) Format of the firmware files

The file names for the firmware files have the following formats:

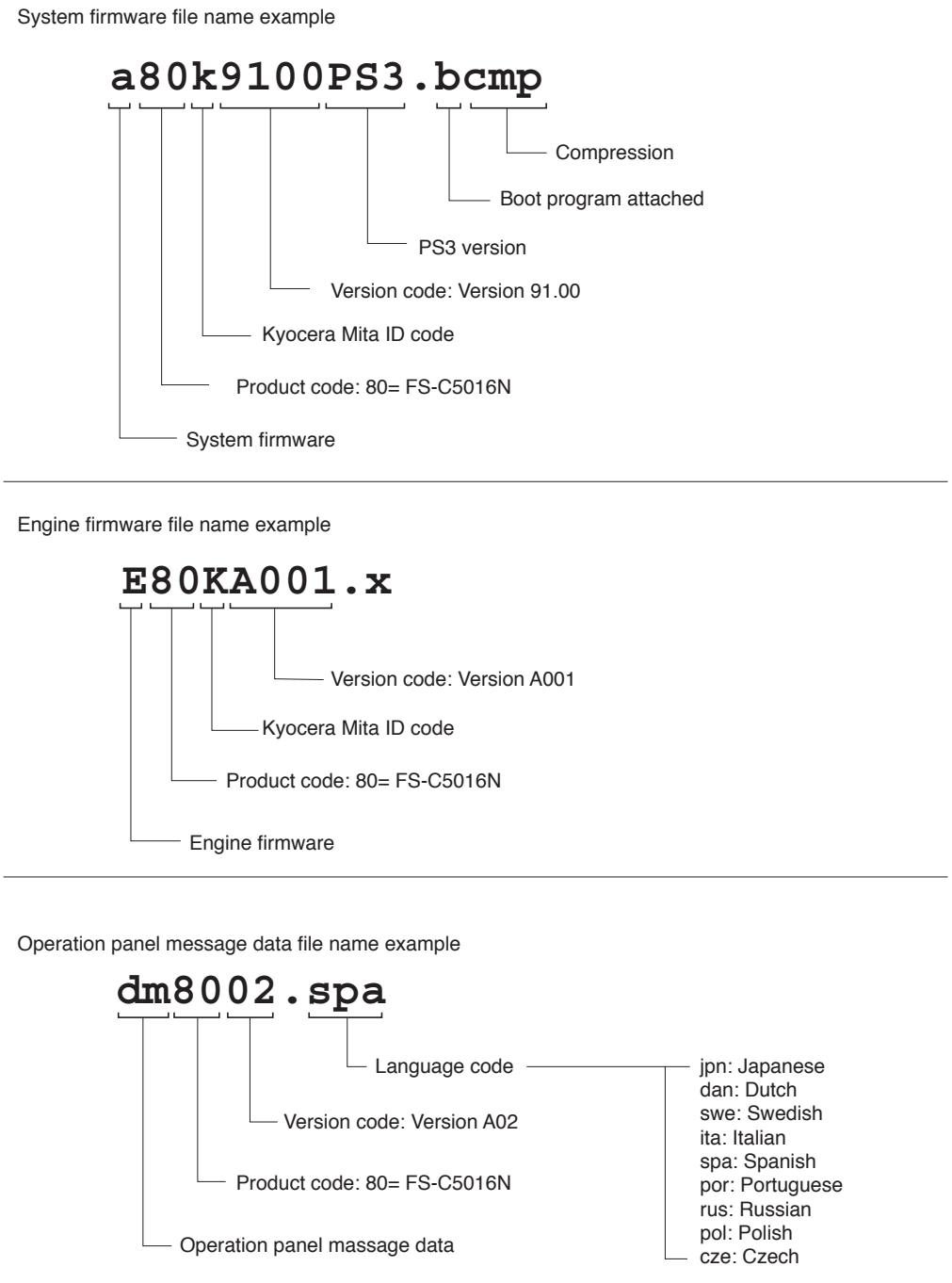


Figure 1-7-1

(2) Downloading firmware via the parallel interface

To download the system firmware using the parallel interface, use the procedure below. Note that you can download both the system and engine firmware at a time.

1. Turn printer and PC power off.
2. Connect the parallel printer cable between the PC and the printer.

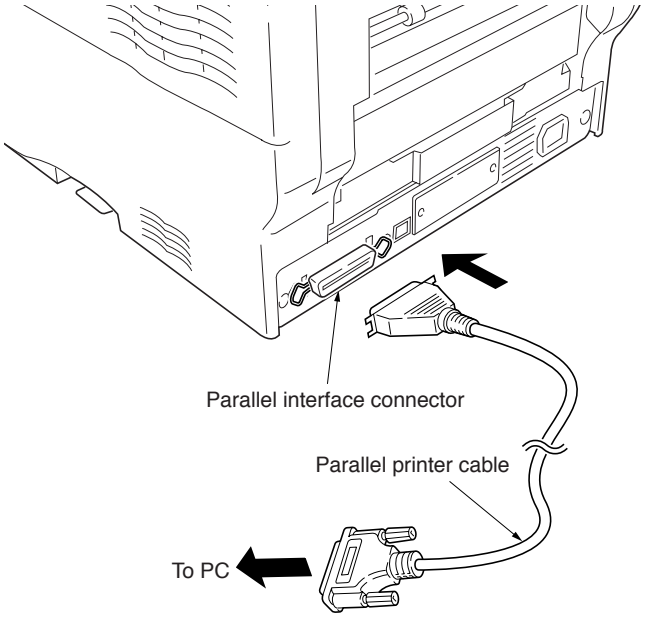


Figure 1-7-2

3. Turn printer power on.
4. Confirm that display ① is displayed.
5. At the DOS prompt, enter command ②.
   * Enter UPGR'SYS' in capitals.
6. Confirm that message display ③ is displayed.
7. At the DOS prompt, enter command ④ so that the system firmware (example: s80K9100.bcmp) and the engine firmware (example: E80KA005.x) are copied to the printer.
8. Message display ⑤ is displayed during downloading. When message display ⑥ is displayed to indicate downloading is finished, turn printer power off and then turn on.
9. Confirm that message display ⑦ is displayed after warm-up.
10. Print a status page. (See page 1-4-2.)
11. Check that the status page shows the updated firmware version.

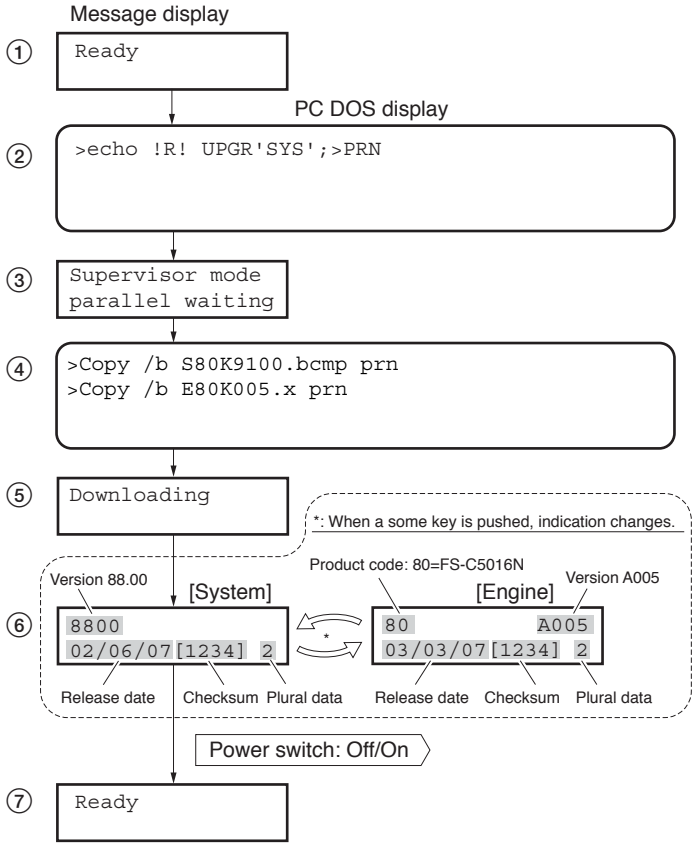


Figure 1-7-3

(3) Downloading firmware using the memory card

The procedure below provides how to download firmware from a memory card. Note that you can download both the system and engine firmware at a time.

1. Turn printer power on.
2. Insert the memory card into the printer's memory card slot.

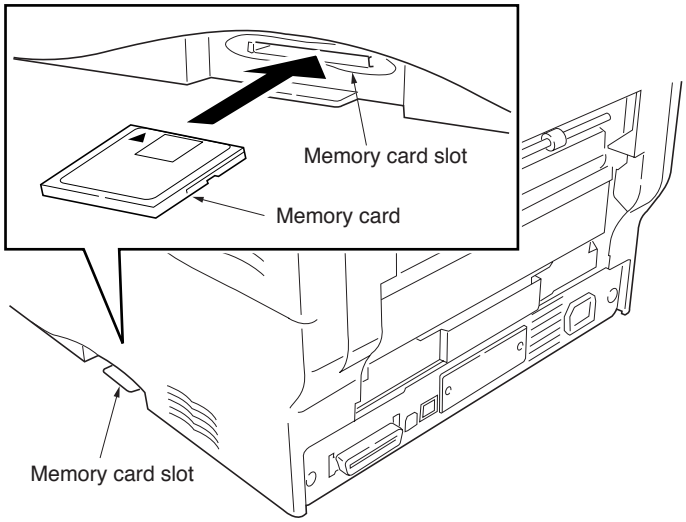


Figure 1-7-4

3. Press MENU key on the printer's operation panel and carry out the memory card formatting procedure ①.
4. When formatting is complete, turn printer power off.

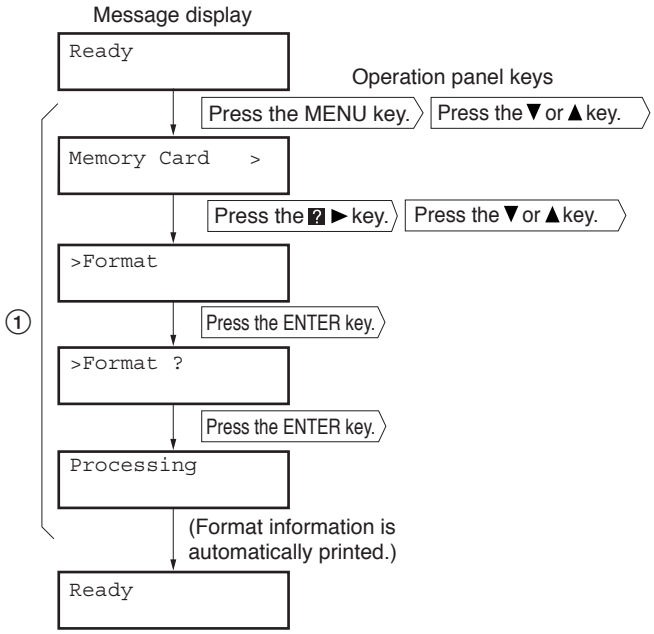


Figure 1-7-6

5. Remove the formatted memory card from the memory card slot.

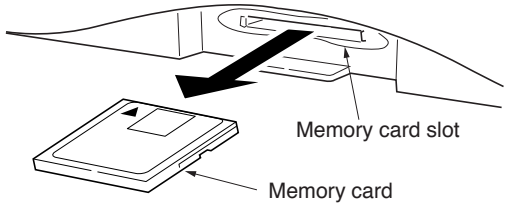


Figure 1-7-7

6. Insert the memory card to the PC's slot or to the adaptor.
7. Copy the firmware file to download to the root directory of the memory card.
8. Remove the memory card from the PC's slot or the adaptor.

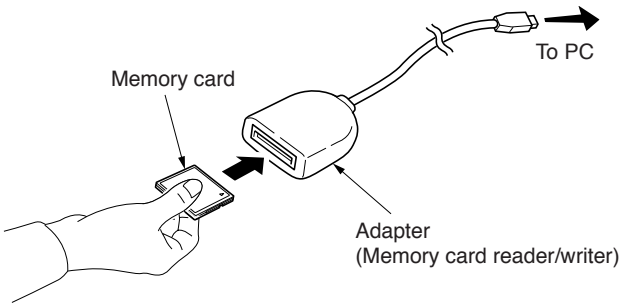


Figure 1-7-8

9. Confirm that the printer's power switch is set to off.
10. Insert the memory card into the printer's memory card slot.

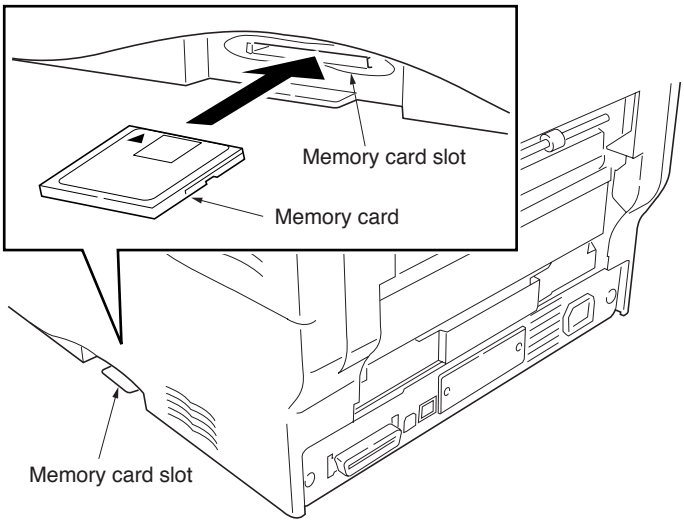


Figure 1-7-9

11. Turn printer power on. The firmware file in the memory card will be automatically downloaded.
12. Message display ① is displayed during downloading. When message display ② is displayed to indicate downloading is finished.
13. Turn printer power off.
14. Remove the memory card from memory card slot.
15. Turn printer power on.
16. Confirm that message display ③ is displayed after warm-up.
17. Print the status page. (See page 1-4-2.)
18. Print the status page to check that the firmware version has been updated.

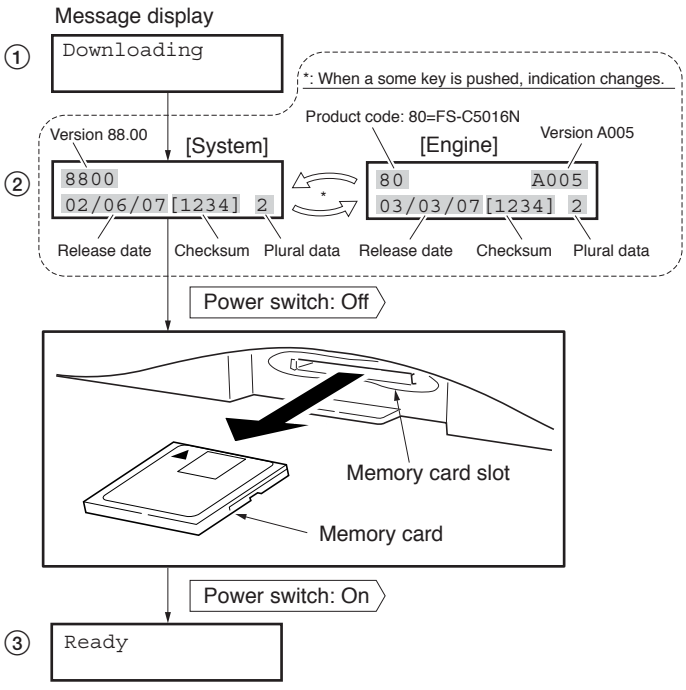


Figure 1-7-10

(4) Downloading the message data

To download the new message data, progress the following procedures.

1. Turn off the power switch to the printer and PC.
2. Connect the parallel printer cable between the PC and printer.

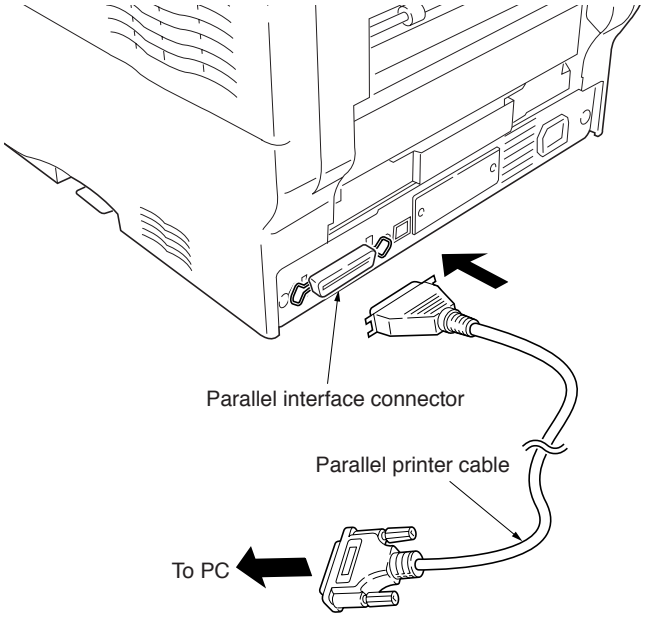


Figure 1-7-11

3. Turn on the power to the printer.
4. Check that the message indication ① is indicated.
5. Input the command ② following the DOS prompt indication.
* Enter BOOST'SPR' in capitals.
6. Check that the message indication ③ is indicated.
7. Input the command ④ following the DOS prompt indication and copy the message data file to the printer (e.g.; dm8002.spa).
8. The message indication ⑤ is indicated while downloading the data file. When the message indication ⑥ is indicated, which shows the end of downloading, turn off the power switch once and then turn it on again.
9. Check that the message indication ⑦ is indicated after warming up the printer.
10. Print the status page. (See page 1-4-2.)
11. Print the status page to check that the firmware version has been updated.

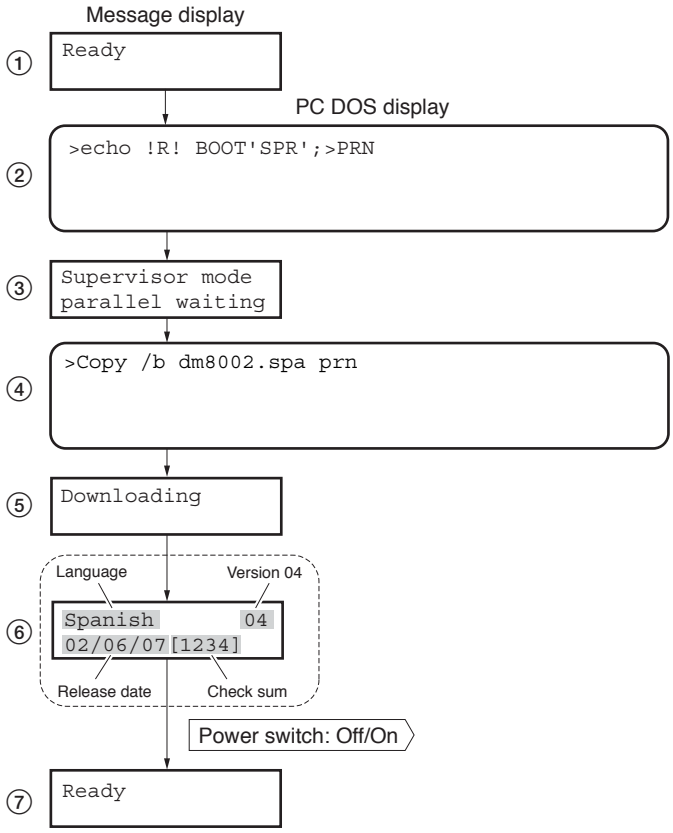


Figure 1-7-12

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2-1-1 Paper feed section

There is paper feed from the paper cassette which can load paper 500 and paper feed from the MP tray which can load paper 100 in paper feed method of this printer.
The Paper feed section is composed of paper cassette, paper feed unit, paper feed drive unit, MP tray and, MP tray feed unit.

(1) Paper feeding from paper cassette

The paper cassette is fit underneath the paper feed unit. The paper stored in the paper cassette is lifted up so that it is pressed against the pickup roller as the bottom plate in the paper cassette is raised by the lifter mechanism. The sheet at top is rewound to the pick up roller and sent to the paper feed roller which forward the paper in the printer. In order to prevent paper misfeed during feeding, the retard roller which is positioned face-to-face with the paper feed roller acts to prevent feeding more than one sheet at a turn of the pick up roller. The paper cassette has an opening at the front side. This opening is a loophole for the paper that is fed by the optional paper feeder or the duplexer which feeds paper into the printer.

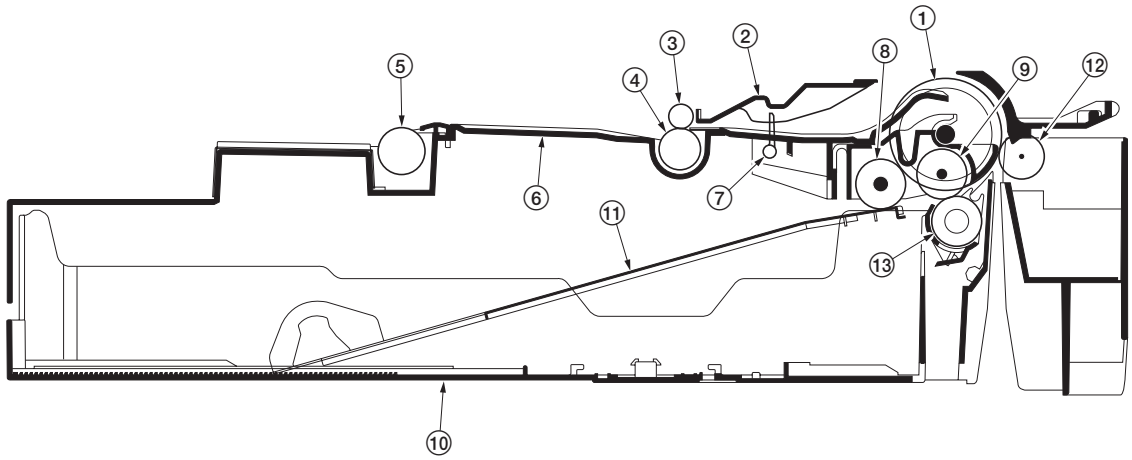


Figure 2-1-1 Paper cassette

1. Guide roller
2. Paper guide
3. Upper registration roller
4. Lower registration roller
5. Secondary transfer roller
6. Feed base
7. Registration sensor (actuator)
8. Pickup roller
9. Feed roller
10. Cassette base
11. Bottom plate
12. Feed pulley
13. Retard roller

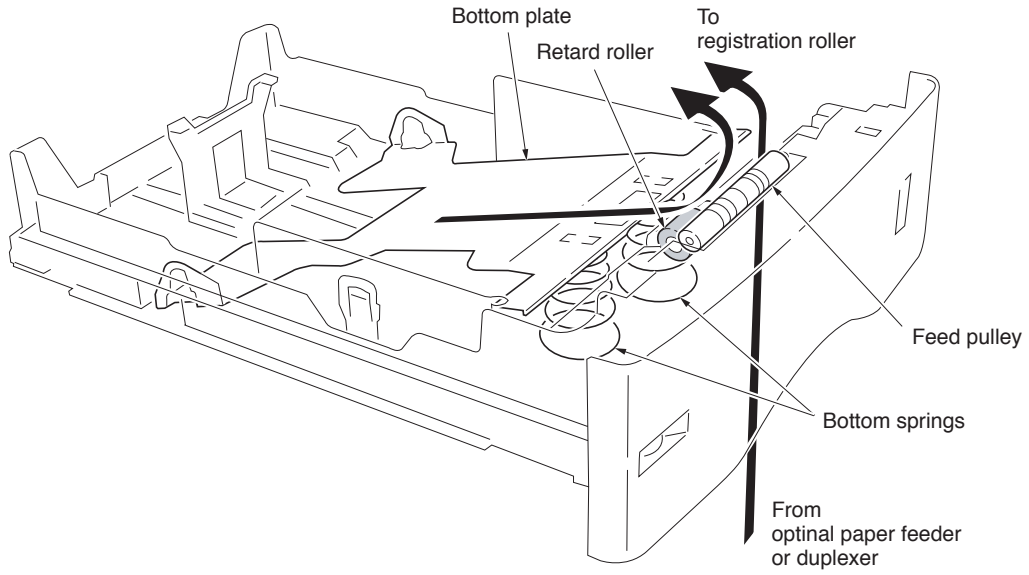
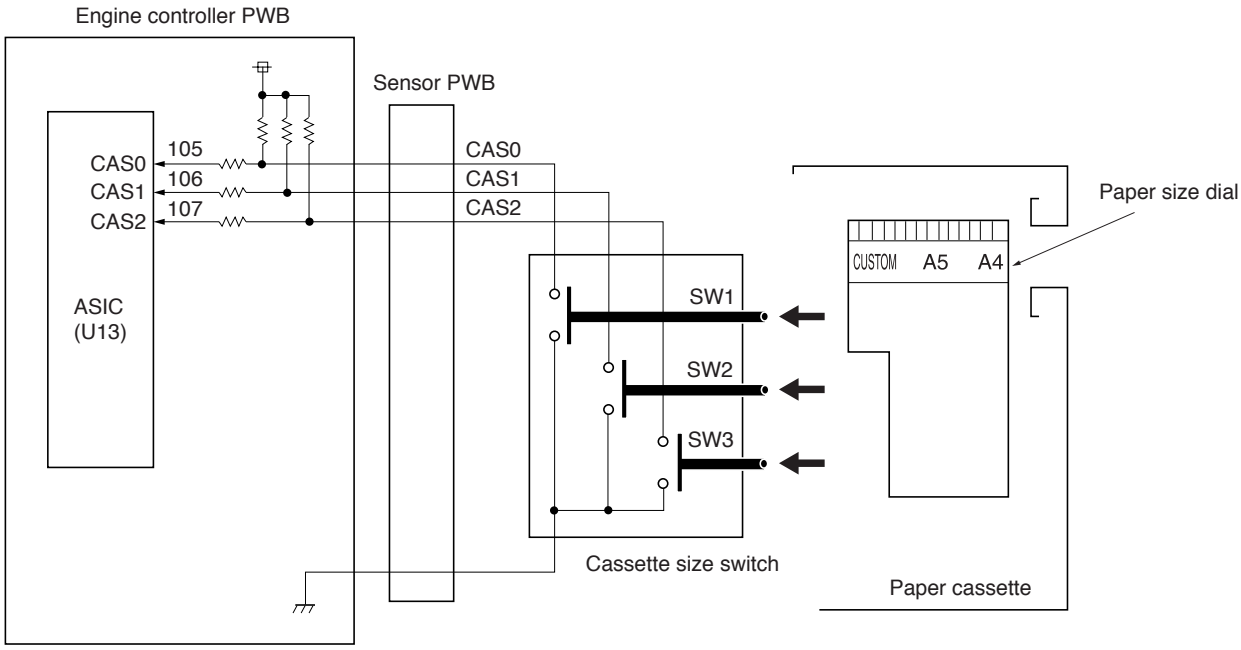
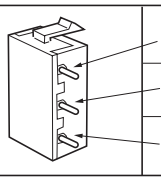


Figure 2-1-2

The paper size dial has predetermined patterns of activating the paper size switches using concaves and convexes according to paper sizes. SW1, SW2, and SW3 produce corresponding signals for paper sizes.



Cassette size switch		Paper size							See note below.
		Cassette not installed	Other	Legal	Letter	A4	A5	B5	
	SW1	H	H	H	H	L	L	L	L
	SW2	H	H	L	L	H	H	L	L
	SW3	H	L	H	L	H	L	H	L
Note: Color calibration cancellaton signal									

Paper size dial

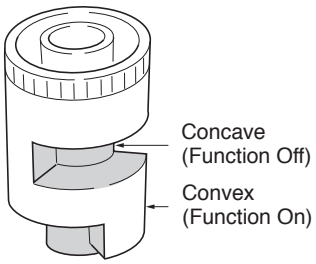
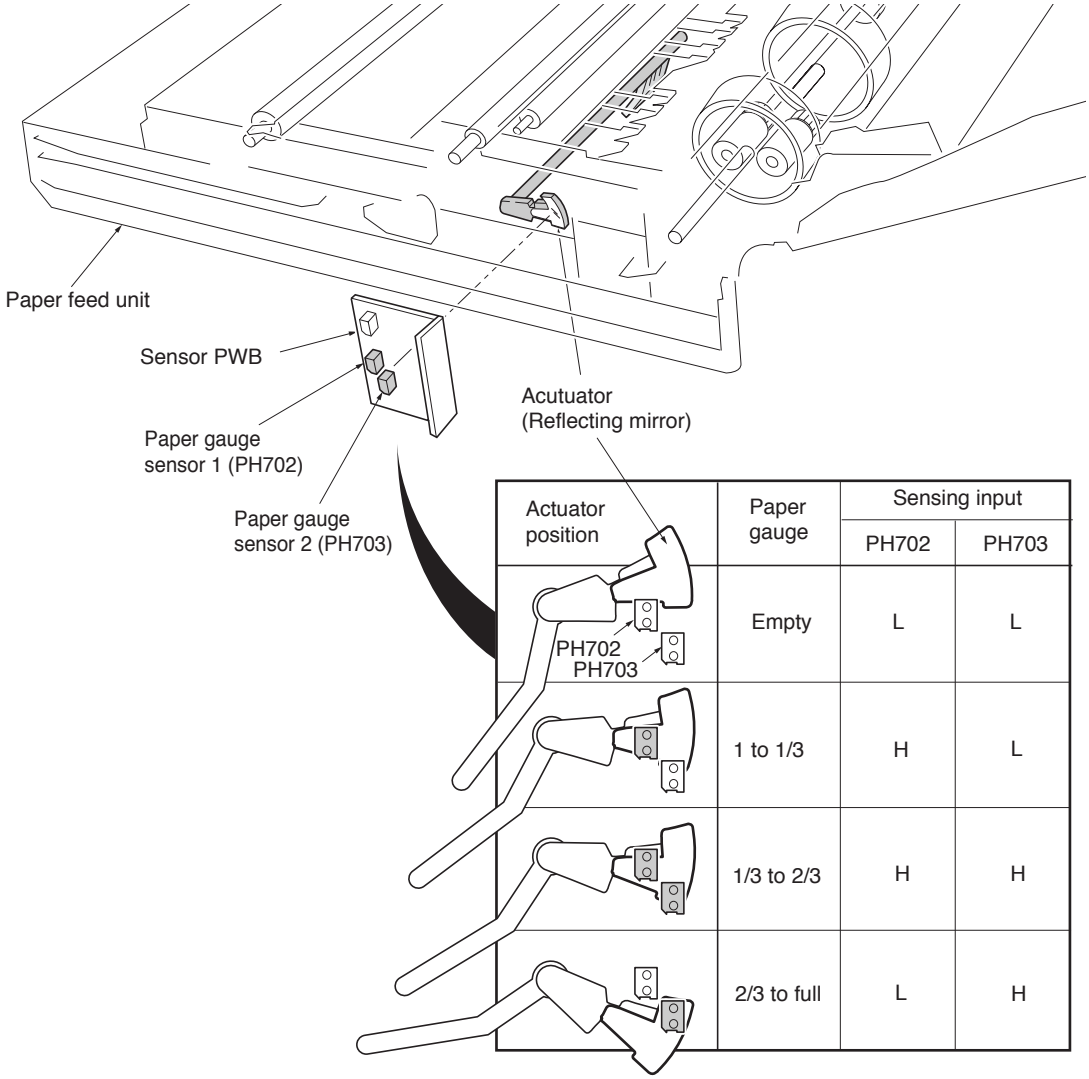


Figure 2-1-3

Paper gauge sensing circuit

The actuator which has a light reflector at one end keeps tracking of the height of the paper stack in the paper cassette. The angle of the reflector varies according to the actuator angle which means the amount of paper remaining. As the reflector moves across the detecting surface of paper gauge sensor (photo interrupter) 1 and 2, the on and off states of these sensors vary in combination as shown in the table below, allowing to determine the amount of remaining paper in the cassette.



Actuator position	Paper gauge	Sensing input	
		PH702	PH703
	Empty	L	L
	1 to 1/3	H	L
	1/3 to 2/3	H	H
	2/3 to full	L	H

Figure 2-1-4

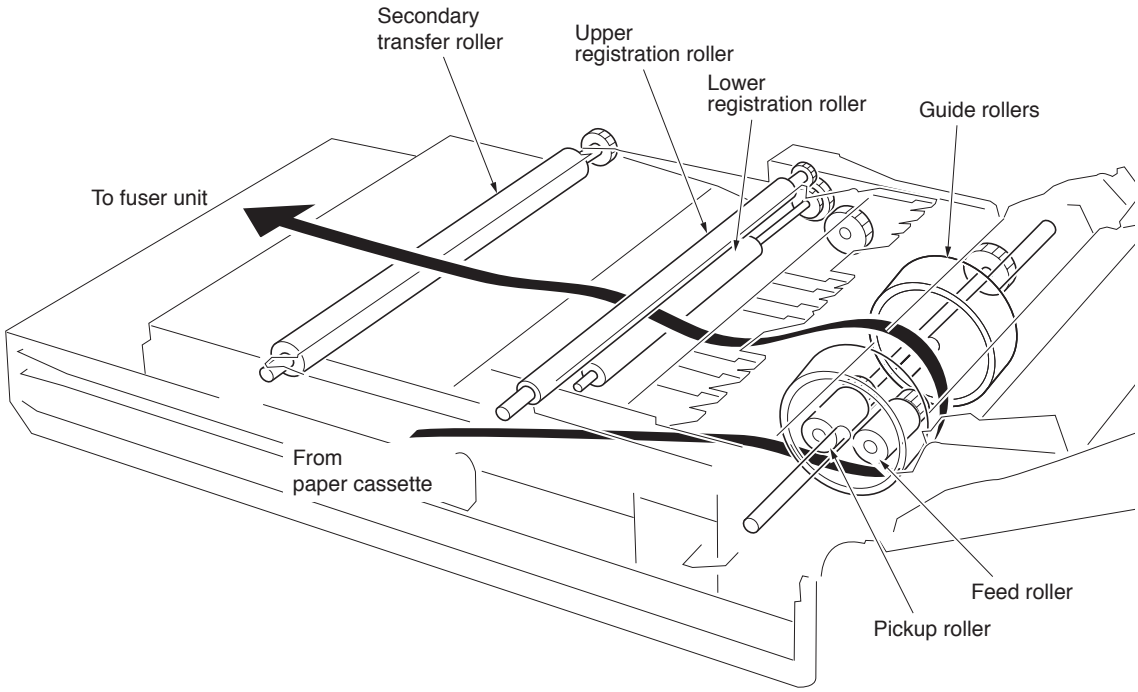


Figure 2-1-5 Paper feed unit

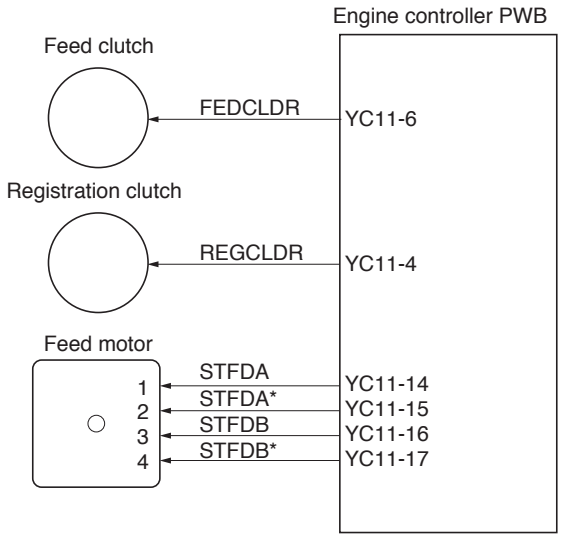


Figure 2-1-6 Paper cassette paper feed section block diagram

(2) Paper feeding from MP tray

The MP tray bottom which is driven by the MP feed solenoid press the paper against the MP feed roller. The sheet is rewound to the MP feed roller, then forward to the registration roller by means of the MP middle roller.

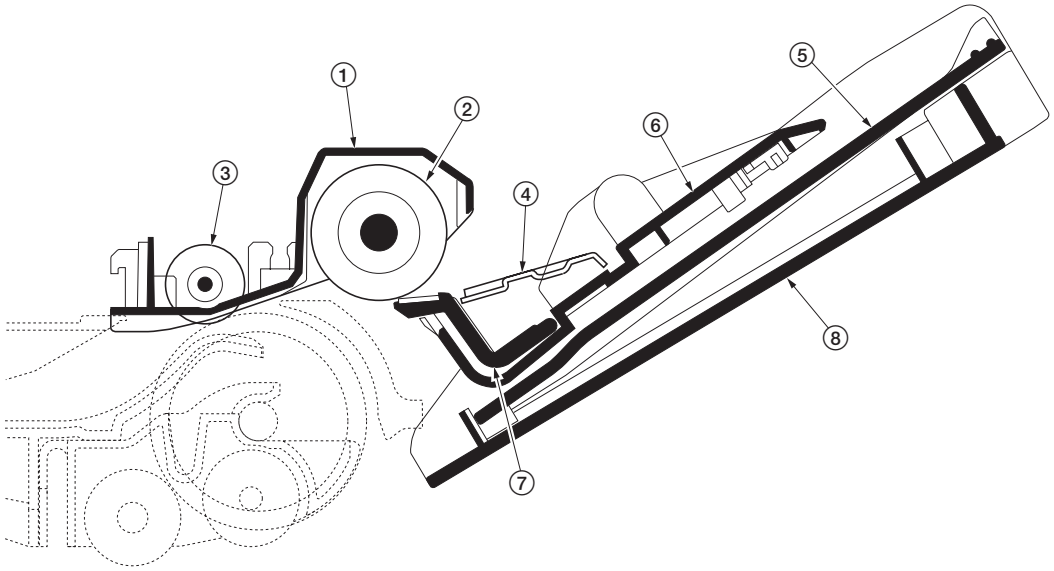


Figure 2-1-7 MP tray paper feed section

1. MP frame
2. MP feed roller
3. MP middle roller
4. Multi bottom
5. MP middle tray
6. MP base
7. Separator
8. MP tray cover

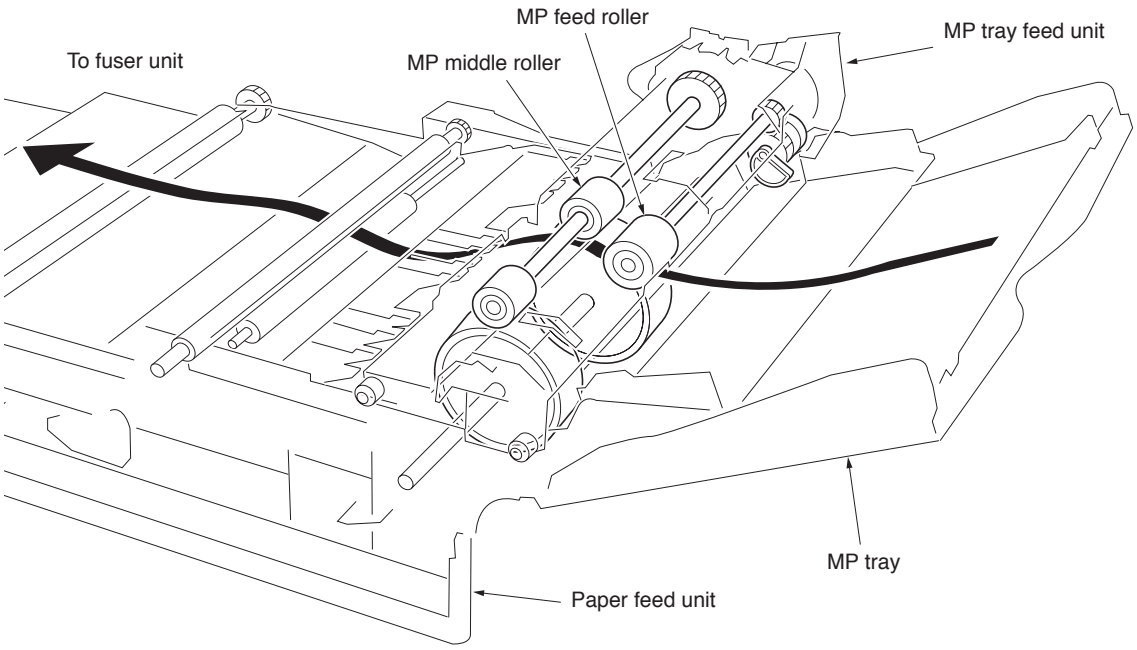


Figure 2-1-8

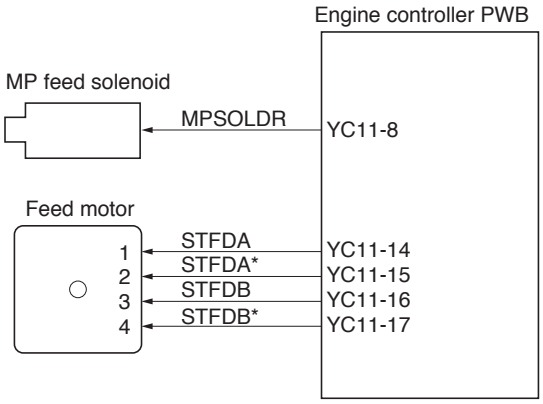


Figure 2-1-9 MP tray paper feed section block diagram

2-1-2 Developing section

(1) Developer

Developing section is composed of mixer screw, developing blade, developing magnet roller and, developing sleeve.

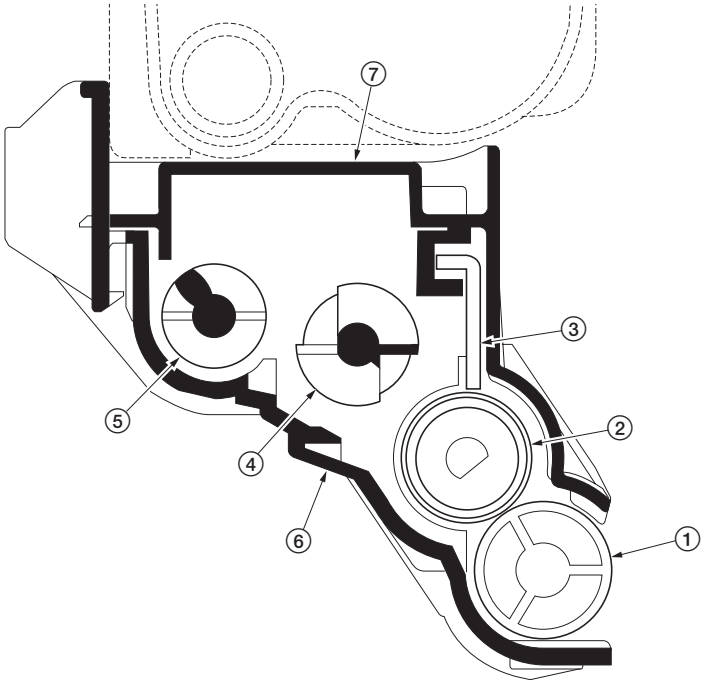


Figure 2-1-10

1. Developing sleeve
2. developing magnet roller
3. Doctor blade
4. Mixer screw B
5. Mixer screw A
6. Developer case
7. Developer lid

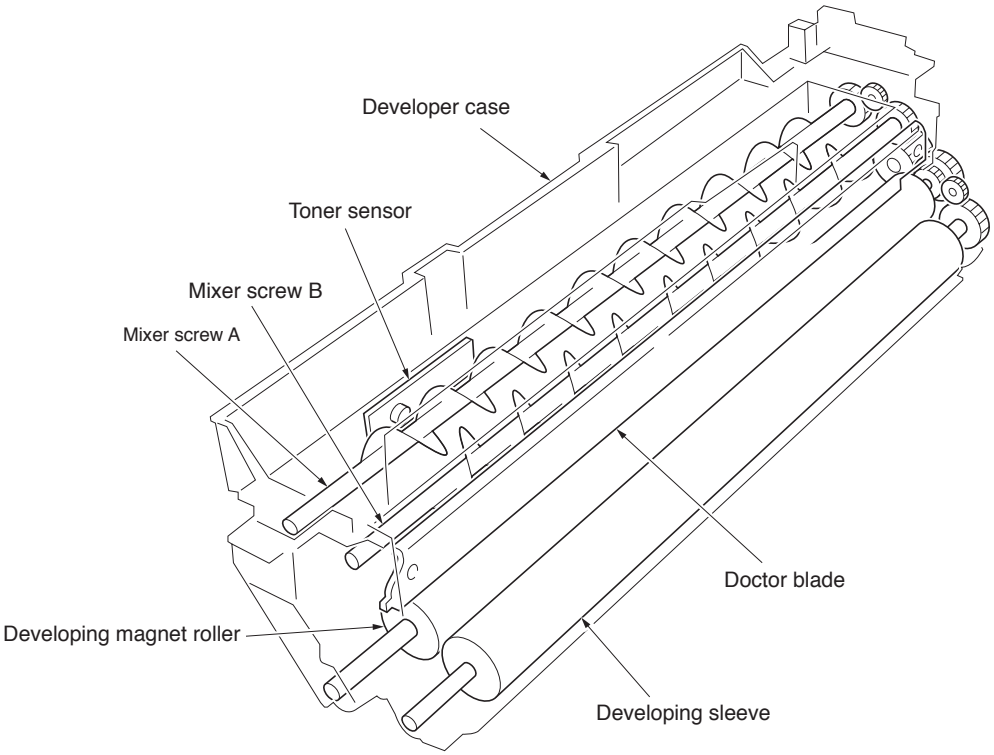


Figure 2-1-11 Developer unit

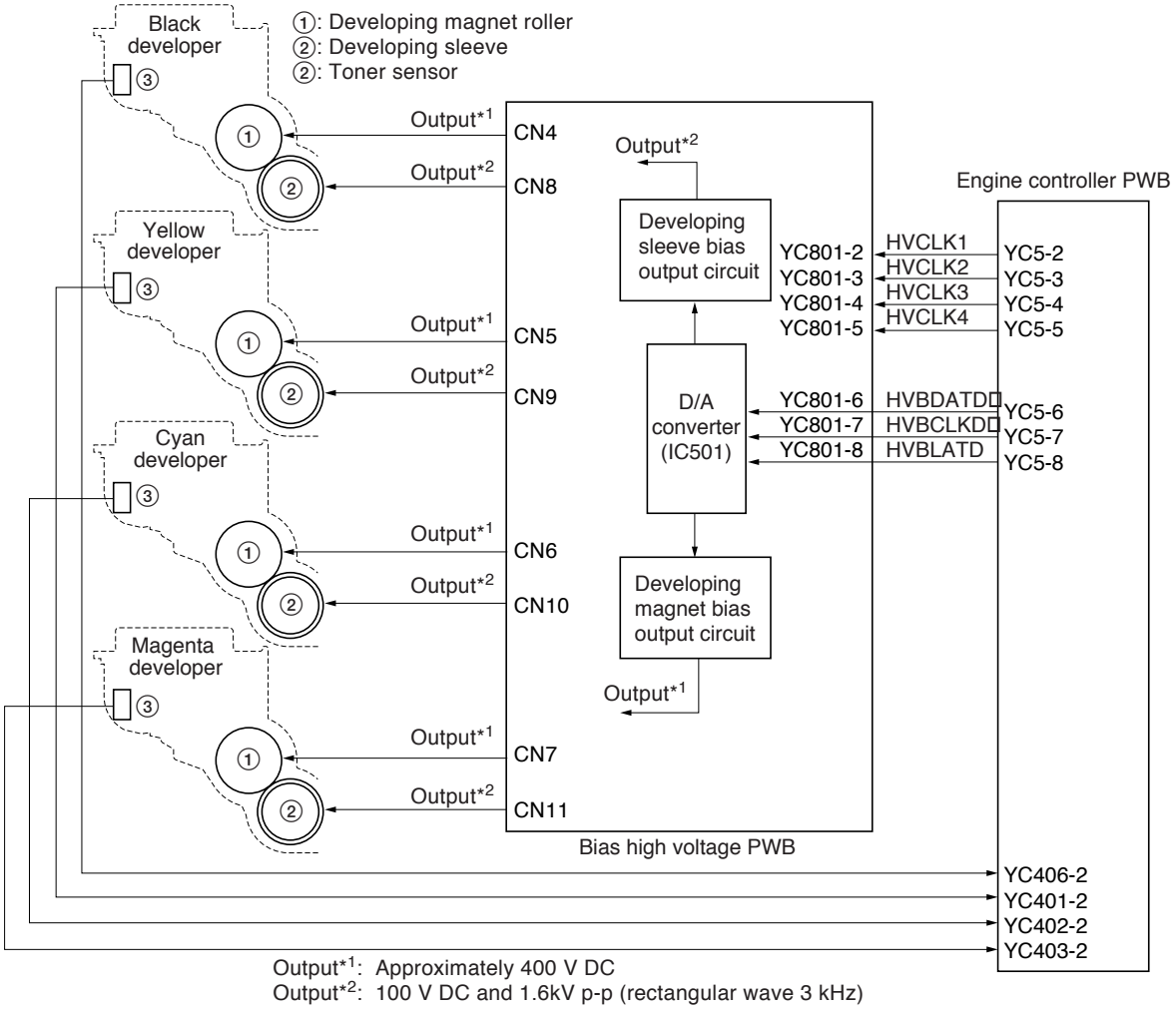


Figure 2-1-12 Developing section block diagram

(2) Touch down developing method

Touchdown development system is a development system having the best of both mono-component system and dual component system. Dual component developer which is a powder of mixture of toner and carrier powder is continuously agitated by mixer screws A and B in the toner hopper in the developer unit. The toner and carrier powder are adsorbed to each other by means of electrostatic charge developed by the friction when they are stirred. The developing magnet roller is comprised of a magnet and a sleeve which revolves coaxially with the magnet. The developer powder forms 'brushes' of toner and carrier on the magnet sleeve along the magnetic field centering the magnet. The 'brushes' are truncated to a constant length of height (approximately 0.5 to 0.55 millimeters) as they pass under the doctor blade. The developing magnet roller lies along the developing sleeve at the distance of 0.40 millimeters. As the developing magnet roller revolves, the brushes formed at pole N1 sweep the developing sleeve and the toner is transferred to the developing sleeve as it is attracted by the difference in potential between them. The toner on the developing sleeve is approximately 70 micrometer in thickness. The developing sleeve is located 0.23 millimeter from the drum. The toner is transferred to the drum by means of the DC/AC bias applied to the developing sleeve.

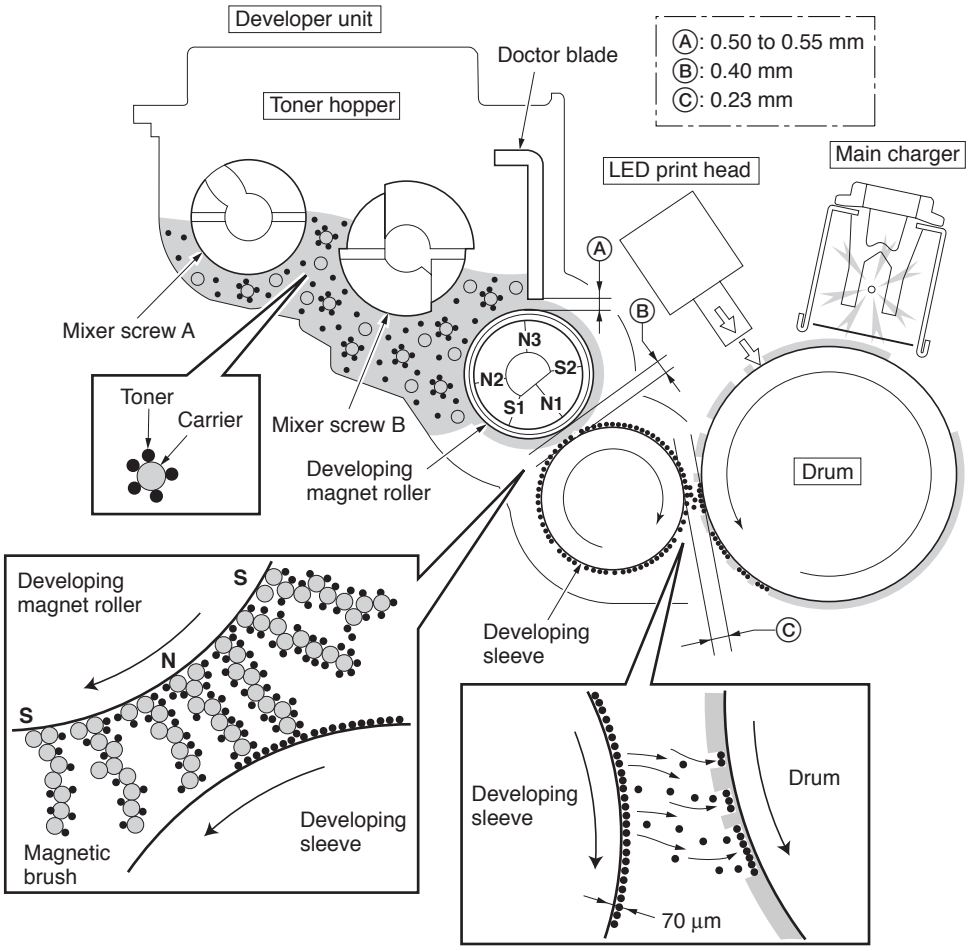


Figure 2-1-13

2-1-3 Drum section

The drum unit includes a photoconductive drum, eraser lamp, LED print head, cleaning blade and, a main charger unit. The drum unit is removable with the main charger unit.

(1) Drum unit

The tandem development system uses four drum units which are isomorphic to each other, in cyan, magenta, yellow, and black colors. In the drum unit, the main charger disperses charging potential over the drum to evenly charge the drum. When the light emitted by LED hits the charged drum, the electrostatic latent image is developed on the drum. The electrostatic latent image is 'developed' by toner applied by the developer unit and transferred onto the primary transfer belt in four colors. The toner remaining on the drum is scraped off by the cleaning blade and driven outside by the spiral screw. The residual potential on the drum is discharged by the exposure to the eraser lamp. Thus, the drum becomes ready for the next main charging.

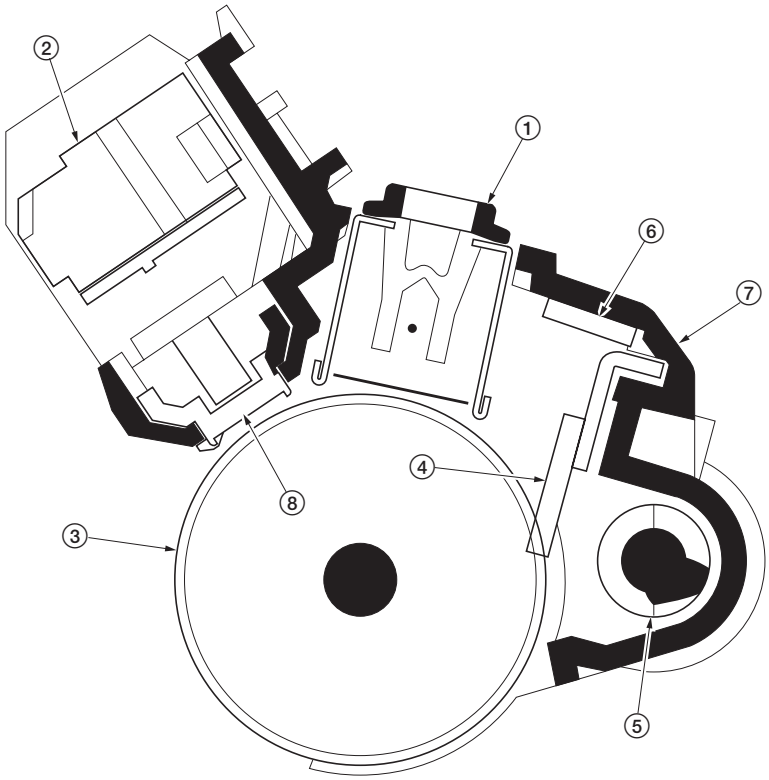


Figure 2-1-14

1. Main charger unit
2. LED print head
3. Drum
4. Cleaning blade
5. Waste toner exit screw
6. Eraser lamp [PWB]
7. Drum frame
8. Lens cleaner

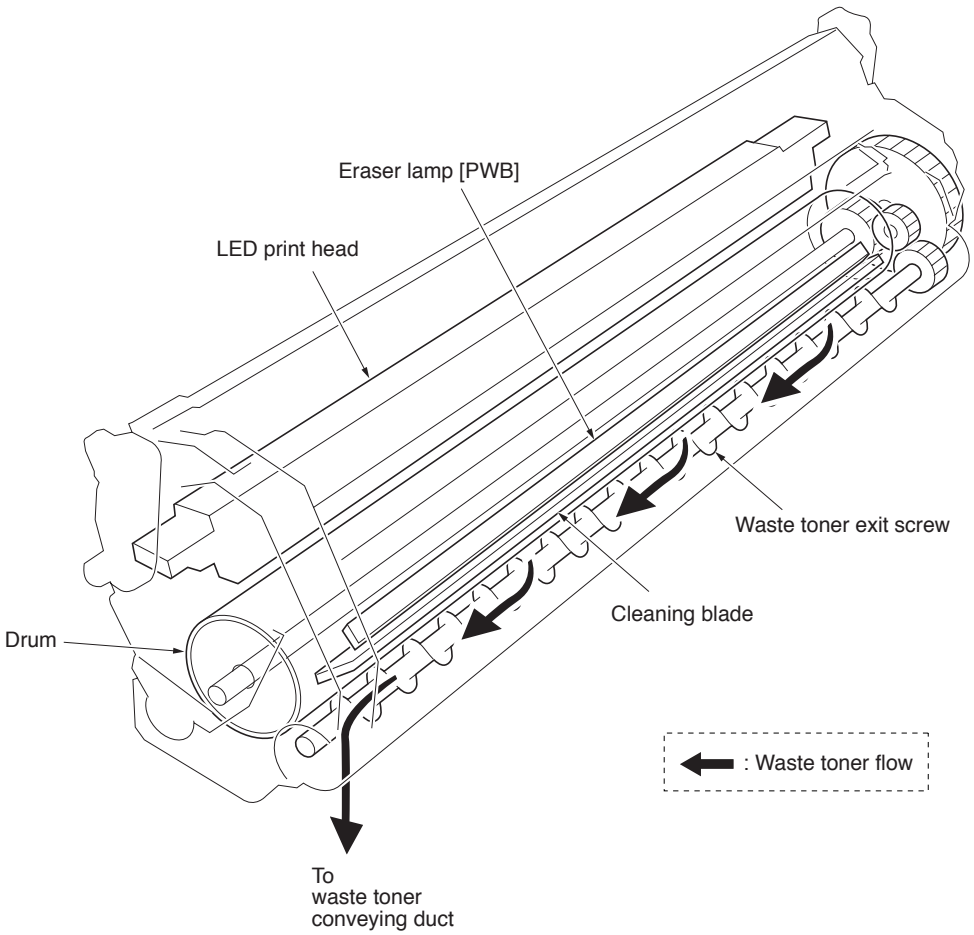


Figure 2-1-15 Drum unit

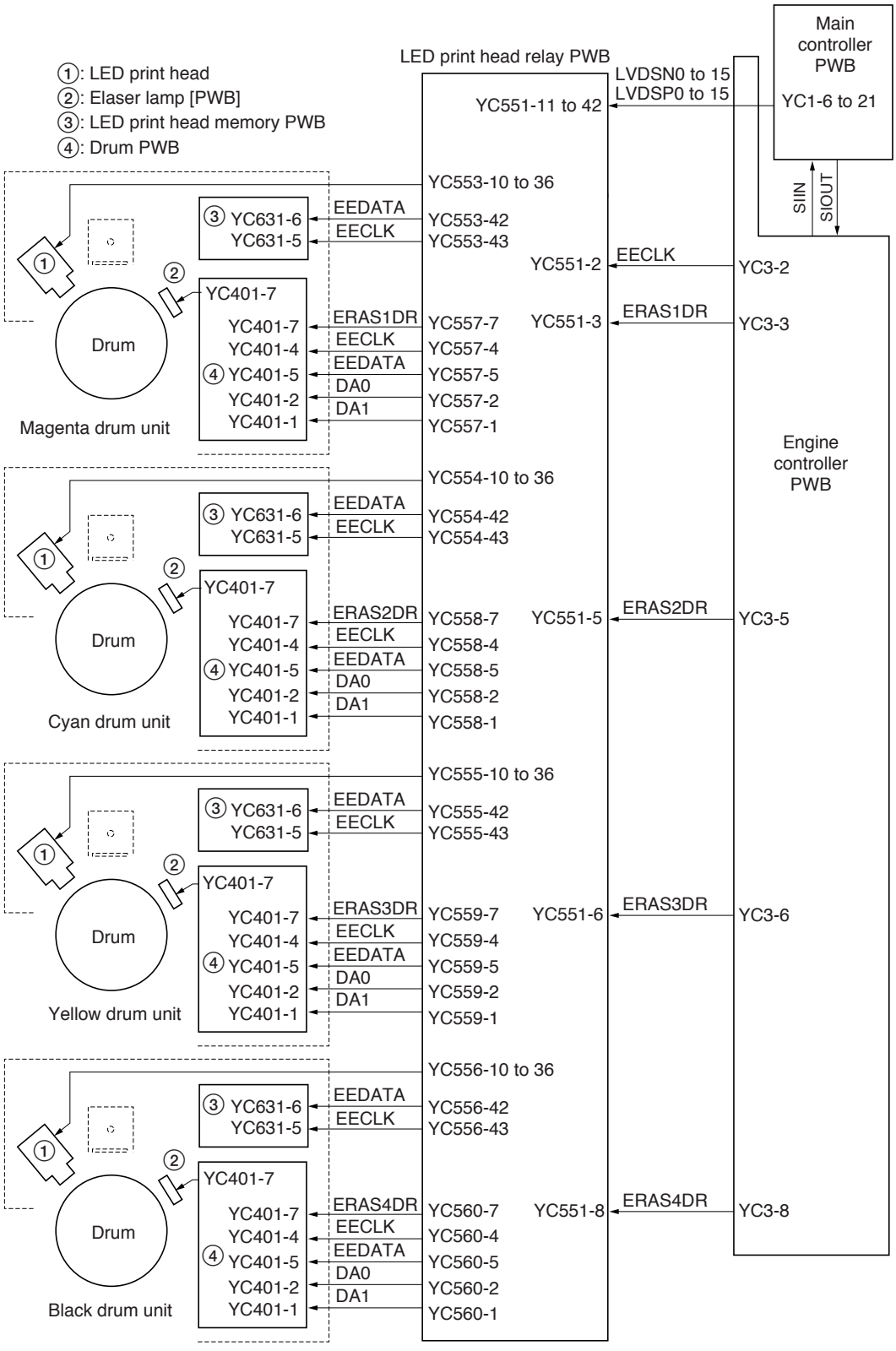


Figure 2-1-16 Drum section block diagram

(2) Waste toner ejecting mechanism

The waste toner which is ejected from the drum units drops on the waste toner conveyer through a duct. The waste toner is conveyed towards the primary transfer cleaning unit, finally stored in the waste toner box.

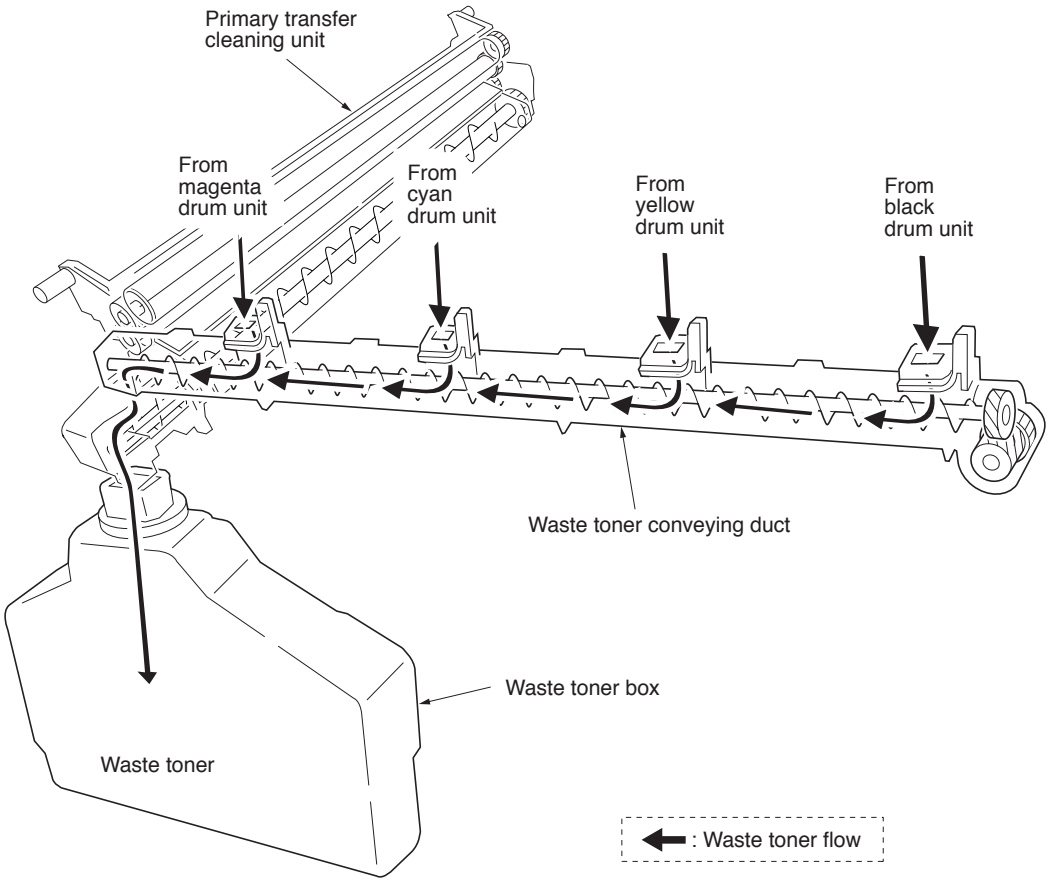


Figure 2-1-17 Waste toner ejecting mechanism

(3) LED print head

The LED print head is comprised of an LED array, SELFOC lens array, and an LED print head memory PWB. The LED array arrays 5120 of LED chips in line. It also includes the driver circuit for the LED array. The light which is switched on and off depending on video data irradiate the drum through the SELFOC lens, to form an image. The LED head is of 600 dpi, therefore the exposure of the light is as dense as 600 dots per a inch. The LED print head memory PWB stores data for compensation of fluctuation of luminosity over all LED chips in the array.

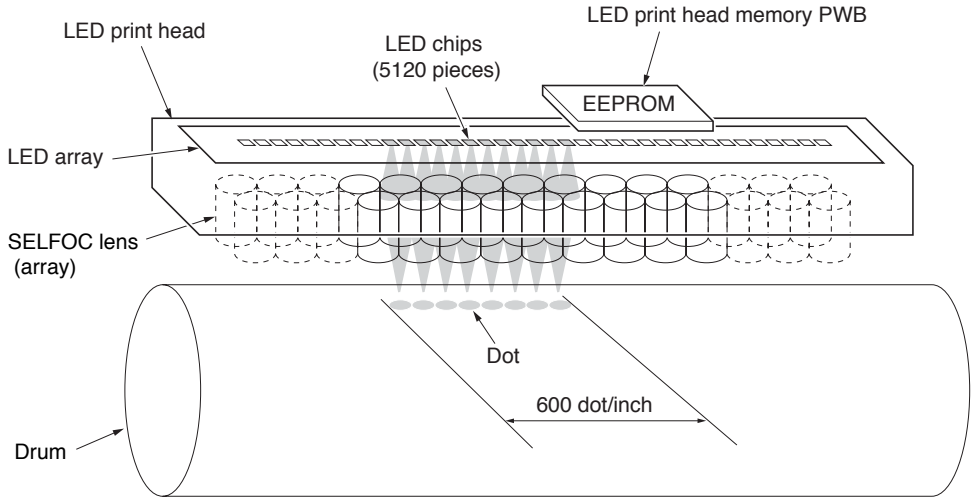


Figure 2-1-18 LED print head

Data to print is processed by the main controller PWB and transferred to the LED print head relay PWB in synchronization with VIDEO signal through the engine controller PWB.VIDEO signal is sent from ASIC (U22) on the mail controller PWB to ASIC (U551) on the LED print head relay PWB using LVDS method. LVDS stands for Low Voltage Differential Signaling which uses 16 pairs of signal lines (32 in all).The main controller PWB converts VIDEO signal into a unique format using LVDS depending on compensating data stored in a flash DIMM.
The LED print head has an LED print head memory PWB mounted. The PWB includes data for compensating the fluctuation of luminosity of every LED chip. At power-up, the compensating data in EEPROM are cached in the flash DIMM on the main controller PWB. In a subsequent power-up, the main controller PWB refers the flash DIMM to obtain the compensating data and the EEPROM is checked with its checksum only.
If the LED print head or the main controller PWB is replaced, checksum becomes error. The compensating data is transferred to the controller PWB again from the EEPROM. In case of failure with EEPROM on the LED print head memory PWB or with compensating data, the printer displays service call 0951, 0952, 0953, or 0954 within approximately 30 seconds.

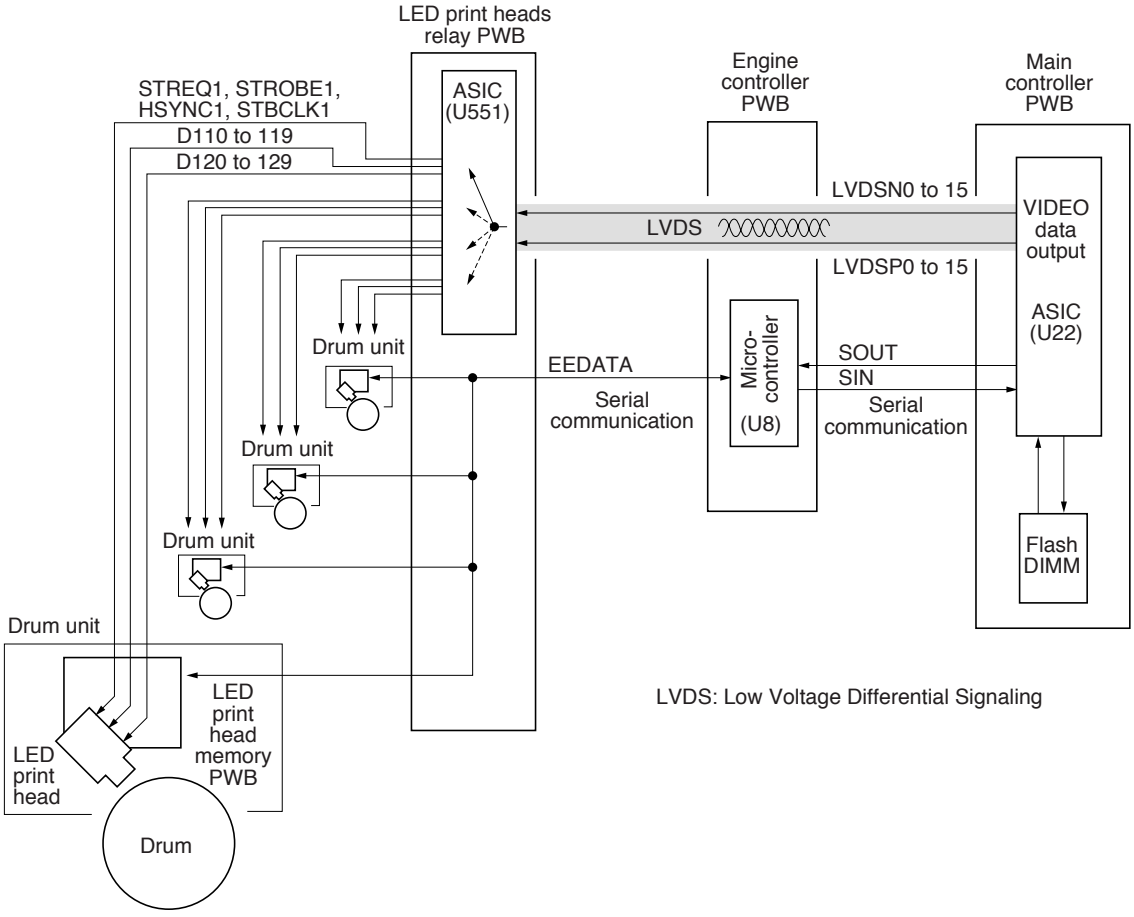
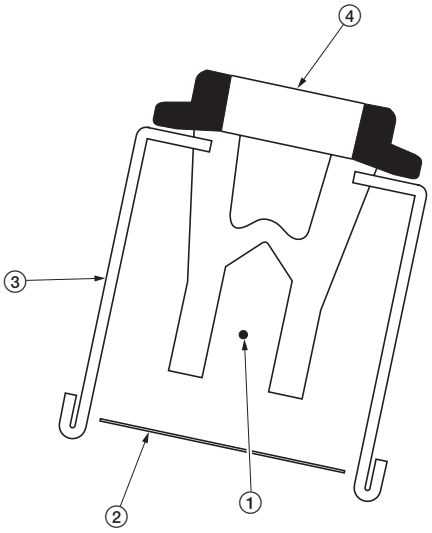


Figure 2-1-19 LED print head block diagram

(4) Main charger unit

Main charger unit is comprised of the main charger wire, main charger grid, main charger shield, and the main charger cleaner which are modularized and fitted to the drum unit.



1. Main charger unit
2. Main charger grid
3. Main charger shield
4. Main charger cleaner

Figure 2-1-20

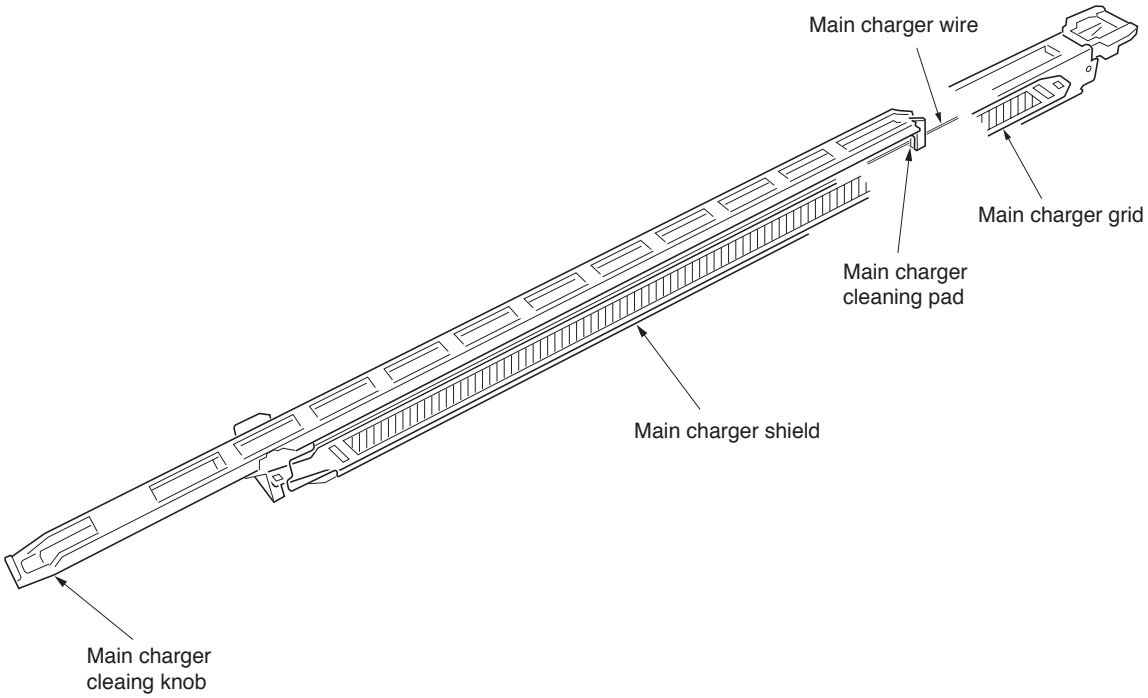


Figure 2-1-21 Main charger unit

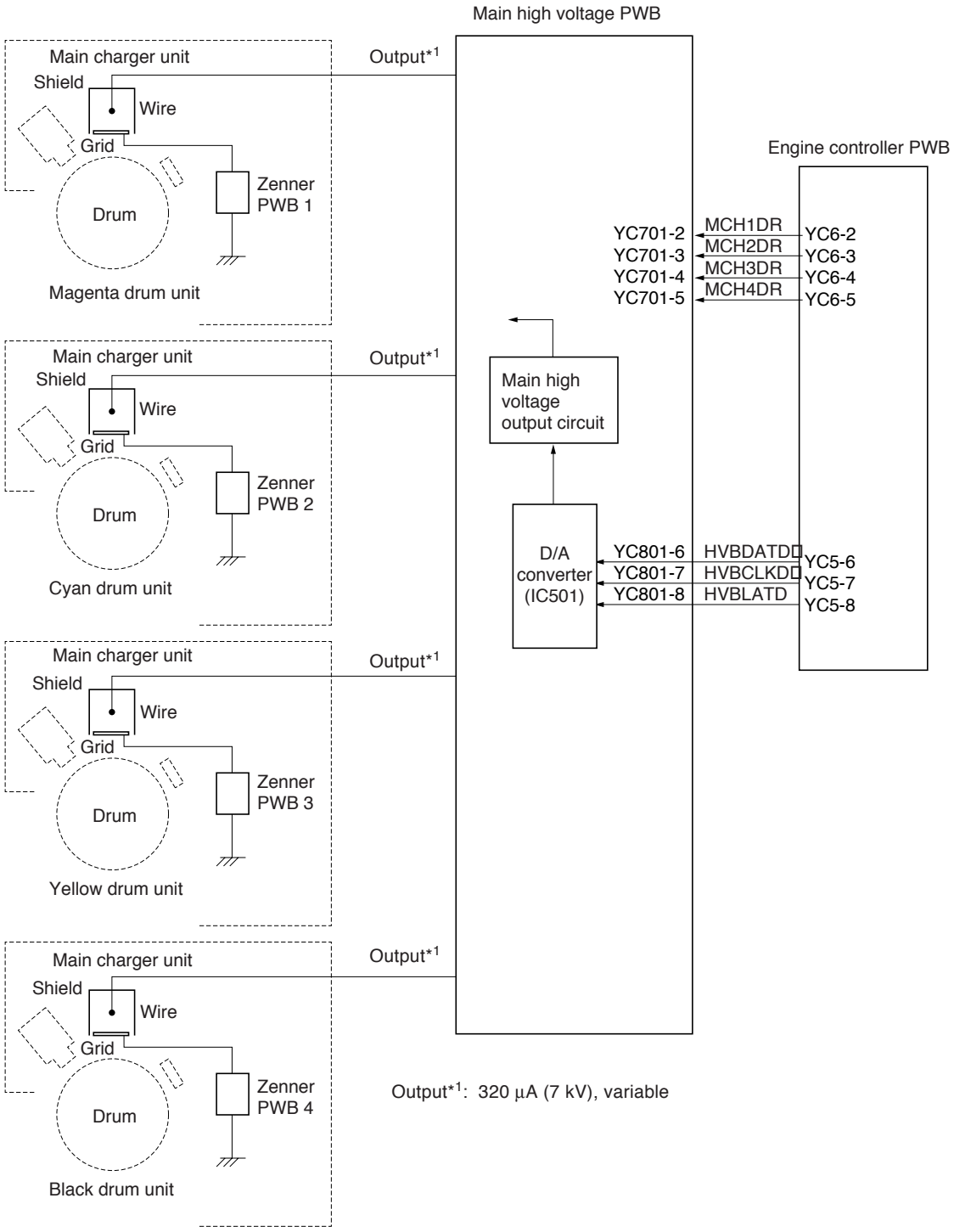


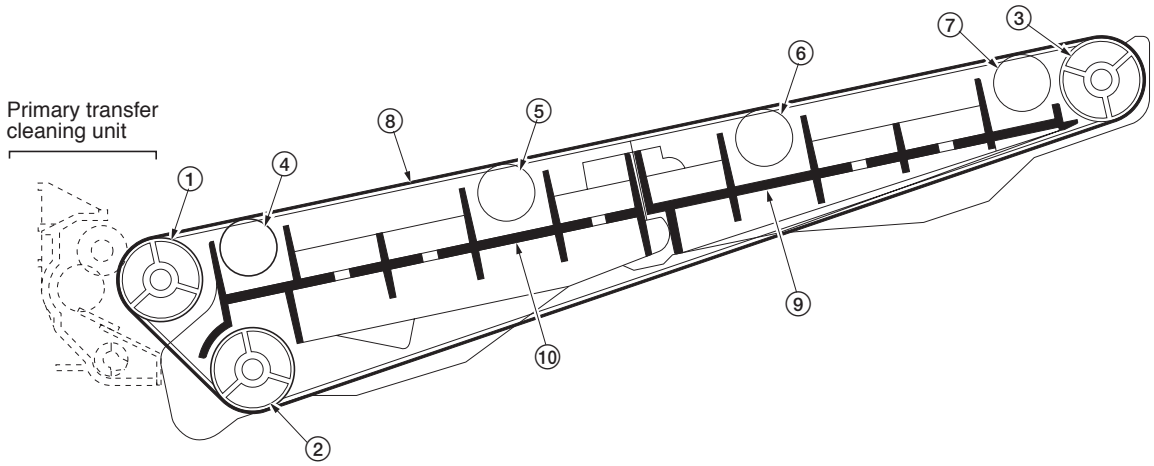
Figure 2-1-22 Main charger output block diagram

2-1-4 Primary transfer section

Primary transfer section is composed of the primary transfer unit and primary transfer cleaning unit.

(1) Primary transfer unit

The primary transfer unit is comprised of the primary transfer belt, tension rollers, and four primary transfer rollers of colors. Color image is transferred on the transfer belt as the four layers different colors. The toner ID sensor mounted on the main frame monitors the density of the toner on the primary transfer belt.



1. Tension roller
2. Tension roller
3. Drive roller
4. Primary transfer roller (magenta)
5. Primary transfer roller (cyan)
6. Primary transfer roller (yellow)
7. Primary transfer roller (black)
8. Primary transfer belt
9. Drive base
10. Tension base

Figure 2-1-23 Primary transfer unit

The primary transfer belt is made of stratum fluorine coat, stratum elastic, and stratum resin in the order from the surface to the bottom. These substances ensure smooth paper travel as well as the durability of the belt itself.

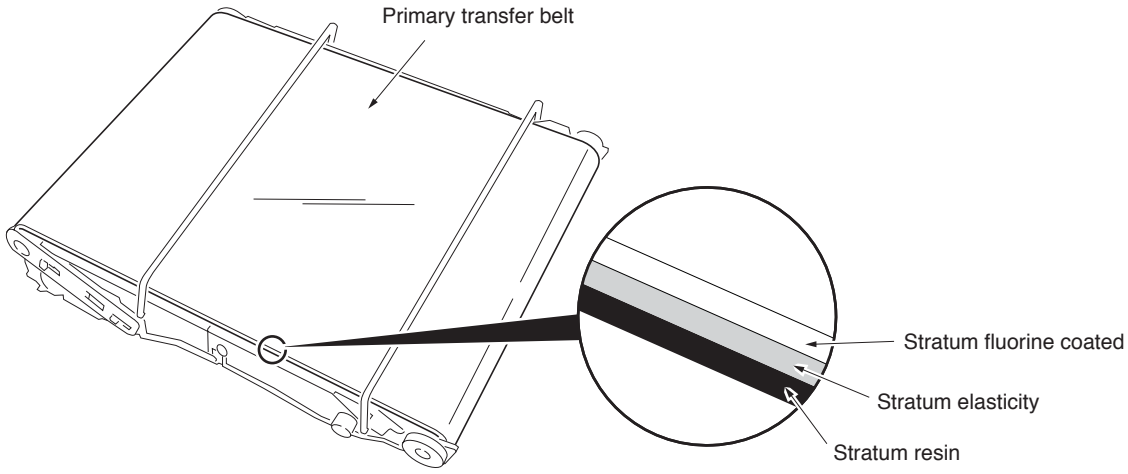


Figure 2-1-24 Primary transfer unit

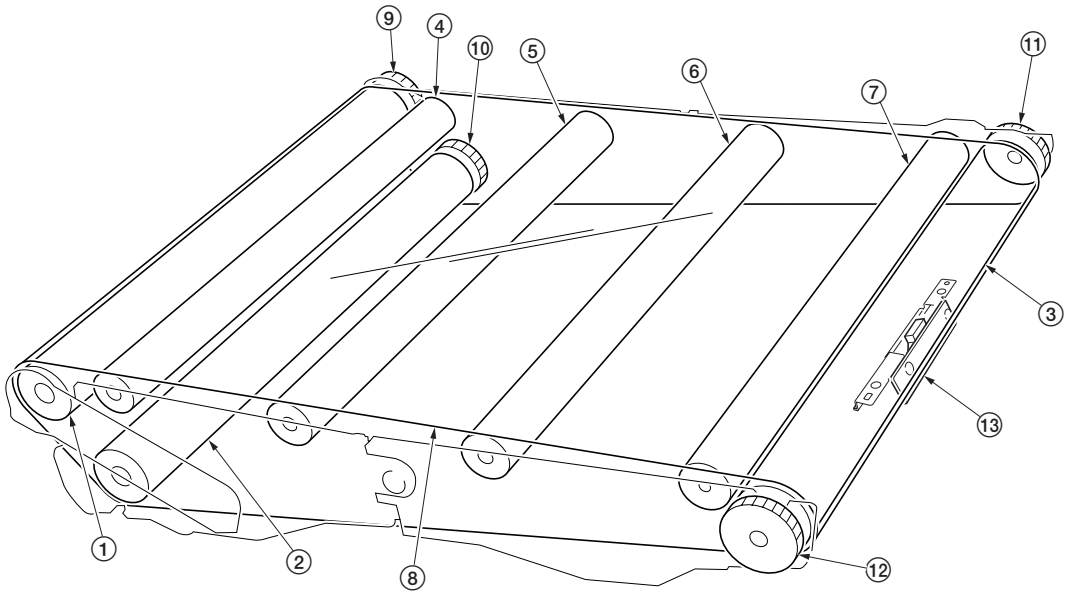


Figure 2-1-25

1. Tension roller
2. Tension roller
3. Drive base
4. Primary transfer roller (magenta)
5. Primary transfer roller (cyan)
6. Primary transfer roller (yellow)
7. Primary transfer roller (black)
8. Primary transfer belt
9. Backup gear 29H
10. Backup gear 29H
11. Image gear 22H
12. Image gear 28S
13. Toner ID sensor (mounted on the main frame)

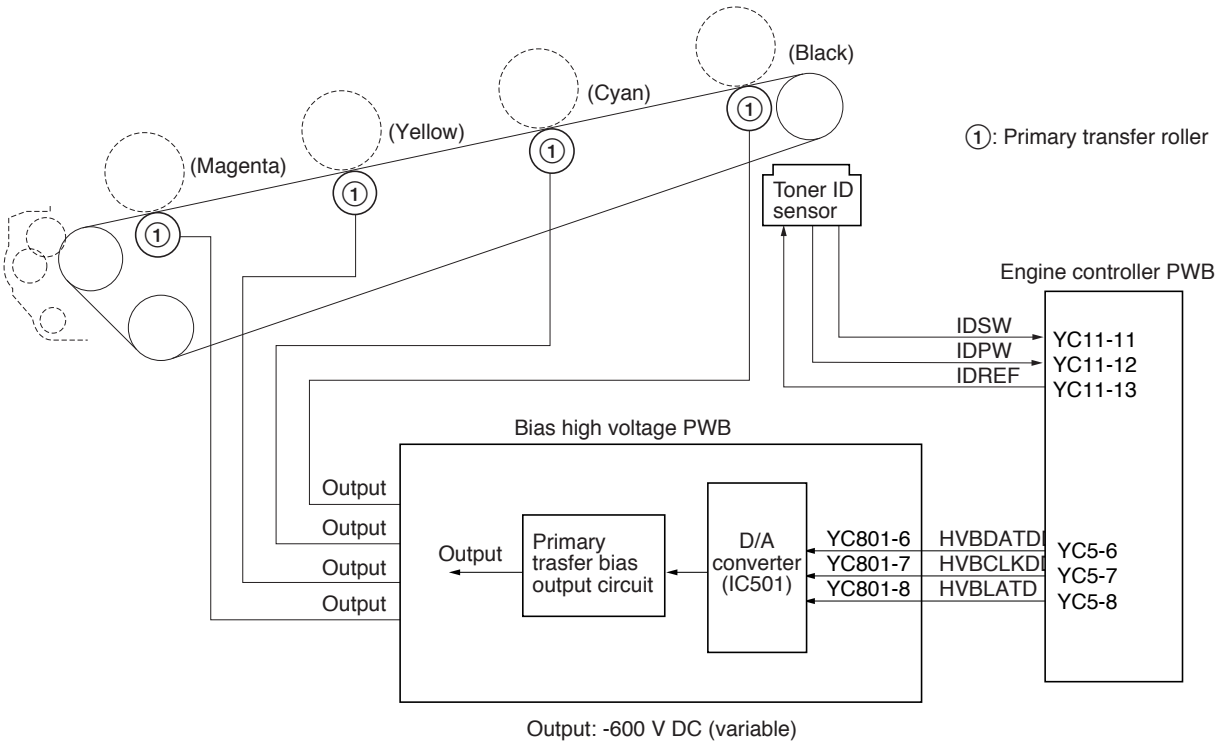
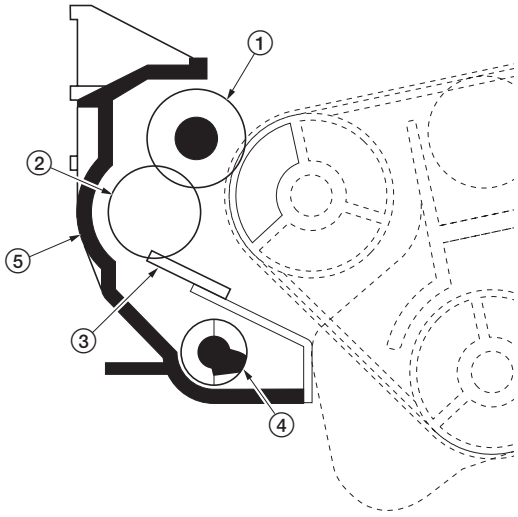


Figure 2-1-26 Primary transfer section block diagram

(2) Primary transfer cleaning unit

The primary transfer cleaning unit is composed of the fur brush, brush cleaning roller, cleaning blade and, cleaning screw. After secondary transferring is done, the toner which remains in the primary transfer belt is collected back in the waste toner box. The brush cleaning roller and the fur brush are applied with the DC bias of approximately 500 V DC through the conductive cleaning frame from the main high voltage PWB. The voltage at the fur brush is approximately 300 V DC.
The toner remaining on the primary transfer belt is transferred onto the fur brush that is biased and continuously revolving. It is then scraped off of the fur brush by the metal brush cleaning roller in the cleaning frame. The brush cleaning roller has the cleaning blade which scrapes off the waste toner. The waste toner scraped off of the brush cleaning roller falls onto the cleaning screw, then driven outward from the cleaning frame.



1. Fur brush
2. Brush cleaning roller
3. Cleaning blade
4. Cleaning screw
5. Cleaning frame

Figure 2-1-27 Primary transfer cleaning unit

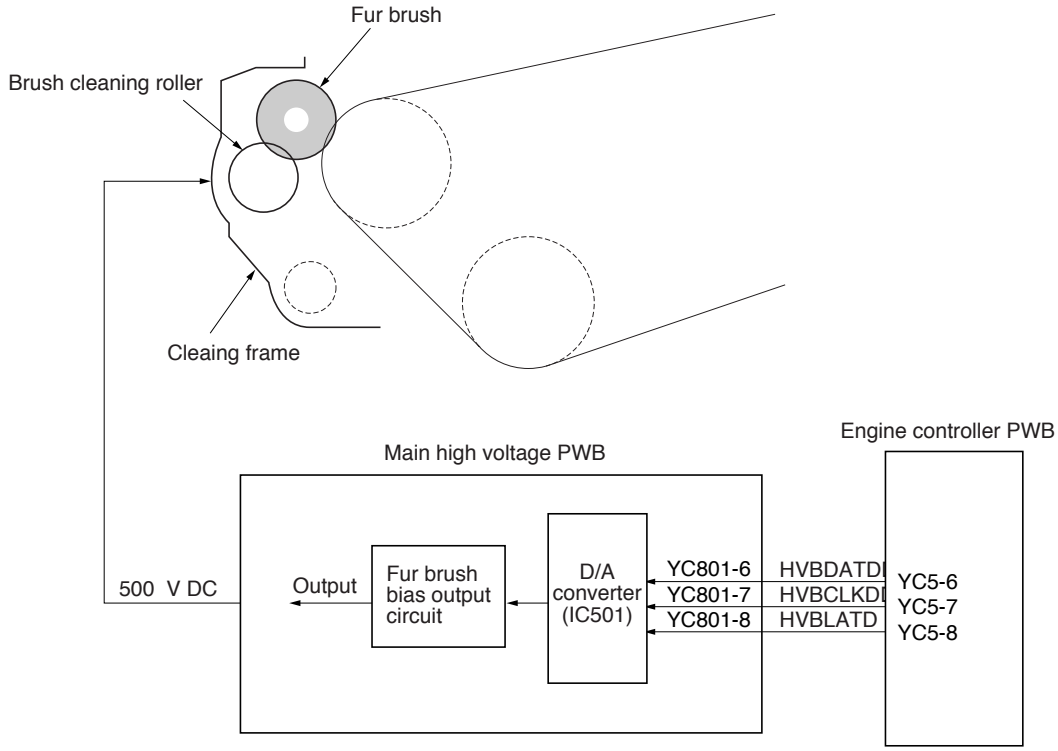


Figure 2-1-28 Primary transfer cleaning unit block diagram

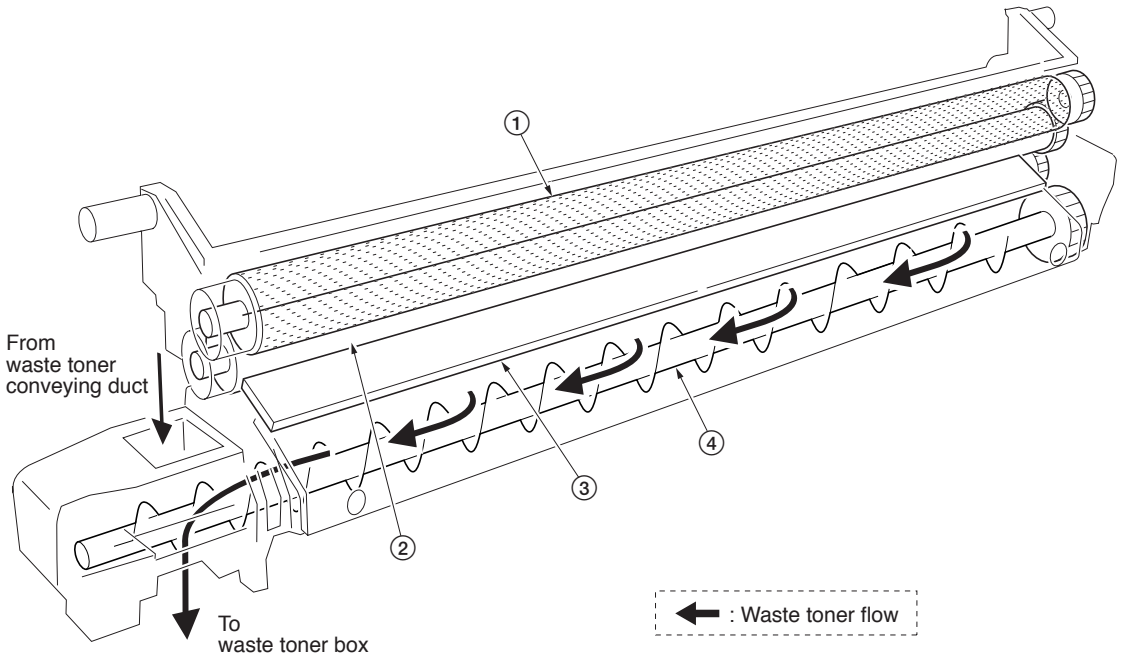


Figure 2-1-29 Primary transfer cleaning unit

1. Fur brush
2. Brush cleaning roller
3. Cleaning blade
4. Cleaning screw

A full color image is developed by recoating four colors on the primary transfer belt. If the density of each color is not kept constant, the resultant color image will be deteriorated. The toner ID sensor mounted on the primary transfer belt to the printer main unit side maintains the constant color fidelity.
The toner ID sensor includes a LED, deflection beam splitters of BS1 and BS2, photo diode PD2 and PD3 that scale toner density, and associated components.
The deflection beam splitter 1 (BS1) splits the light from the LED to S wave and P wave. S wave oscillates vertically in reference to the entrance plane; whereas, P wave oscillates horizontally in reference to the entrance plane. S wave reaches the photo diode (PD1) and acts to stabilize the luminosity of the LED by means of the feed back circuit. P wave is irradiated to toner, then it produces scattered light wave S and reflection wave P which bounced on the primary transfer belt. They reach the deflection beam splitter 2 (BS2) where they are distinguished as P wave and S wave, respectively, then detected by photo diode 2 (PD2) and photo diode 3 (PD3).

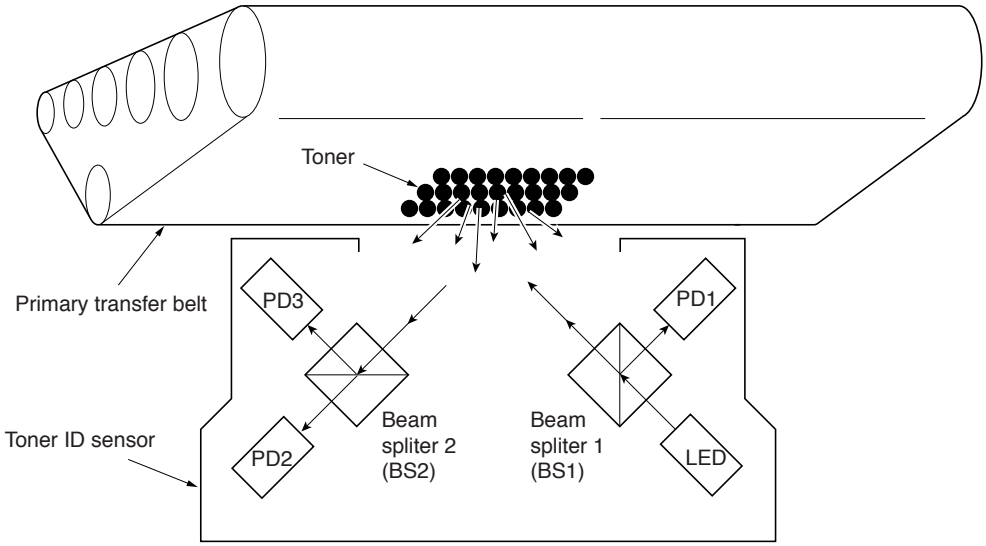


Figure 2-1-30 Toner ID sensor

2-1-5 Secondary transfer and separation section

The secondary transfer and separation section includes the secondary transfer roller which is installed on the paper feed unit. The secondary transfer roller is applied by the bias high voltage PWB of DC bias. The image constituted by toner on the primary transfer belt is transferred on paper by means of the difference in potential. The paper is separated from the transfer belt as the curvature radius of the secondary transfer roller is considerably small.

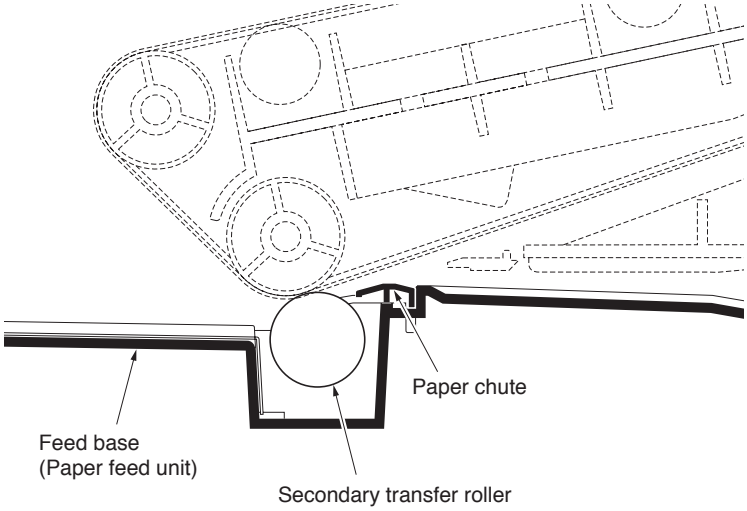


Figure 2-1-31

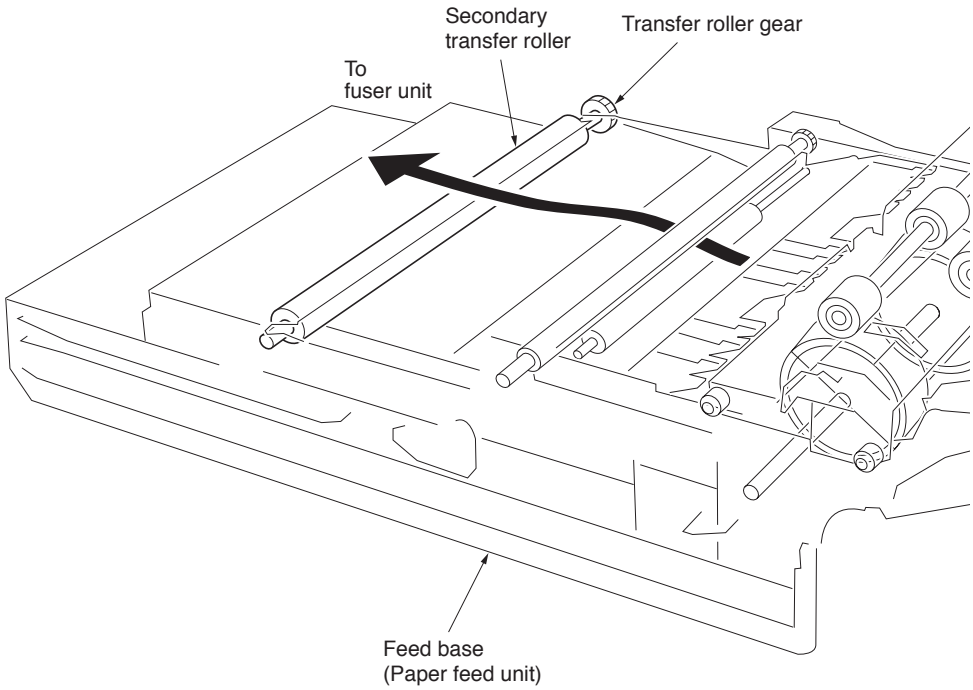


Figure 2-1-32 Secondary transfer unit

The primary transfer roller bias is triggered by a serial data which is generated by the engine controller PWB and derived from the bias high voltage PWB. The engine controller PWB converts current and voltage into serial data and applies it to the bias high voltage PWB. The bias high voltage PWB then uses D/A converter (IC501) and revert it into analog voltage. The analog voltage is applied to the high voltage output circuit which in turn applies the secondary transfer roller with the bias accordingly.

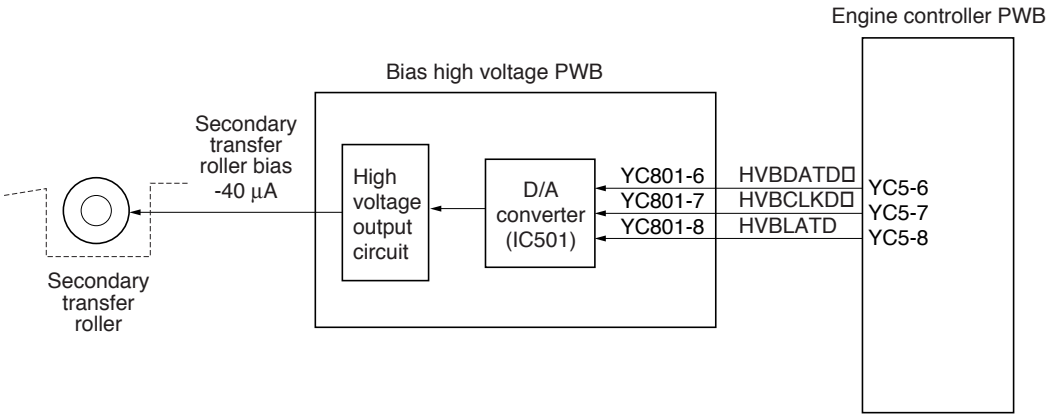


Figure 2-1-33 Secondary transfer unit block diagram

2-1-6 Fuser section

(1) Fuser unit

The fuser unit is composed of the heat roller, press roller, fuser heater lamp 1, fuser heater lamp 2, and the change guide. Paper sent from the secondary transfer and separation section is applied with heat and pressure to permanently fuse toner on paper. The change guide switches the destination of paper to the face-down tray or optional face-up tray. It also sends paper to the duplexer.

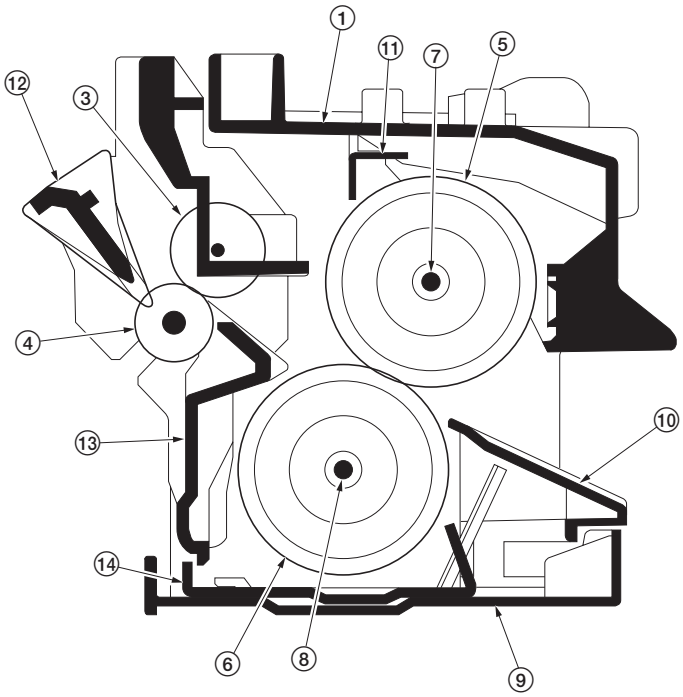


Figure 2-1-34

1. Upper fuser frame
2. Lower fuser frame
3. Upper exit roller
4. Lower exit roller
5. Heat roller
6. Press roller
7. Fuser heater lamp 1
8. Fuser heater lamp 2
9. Lower fuser cover
10. Lower entrance guide
11. Stay plate
12. Change guide
13. Exit guide
14. Fuser frame

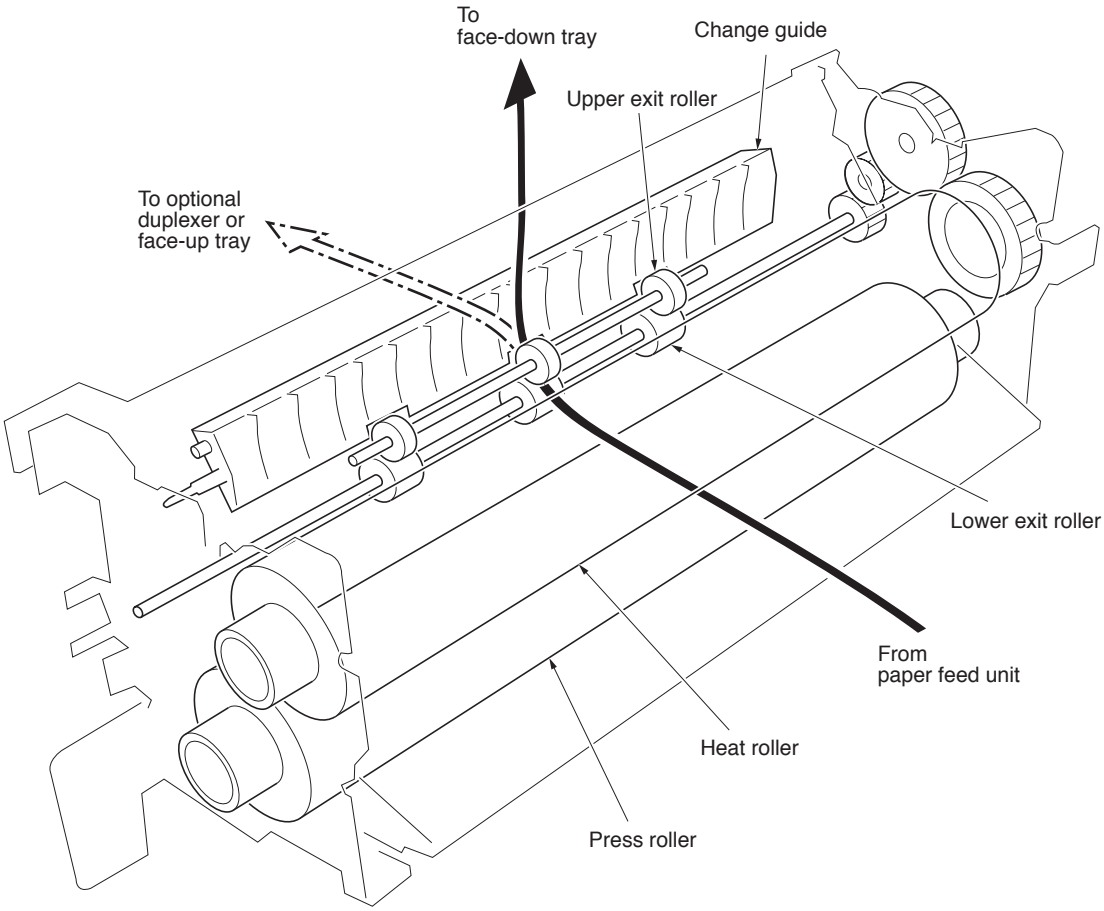


Figure 2-1-35 Fuser unit

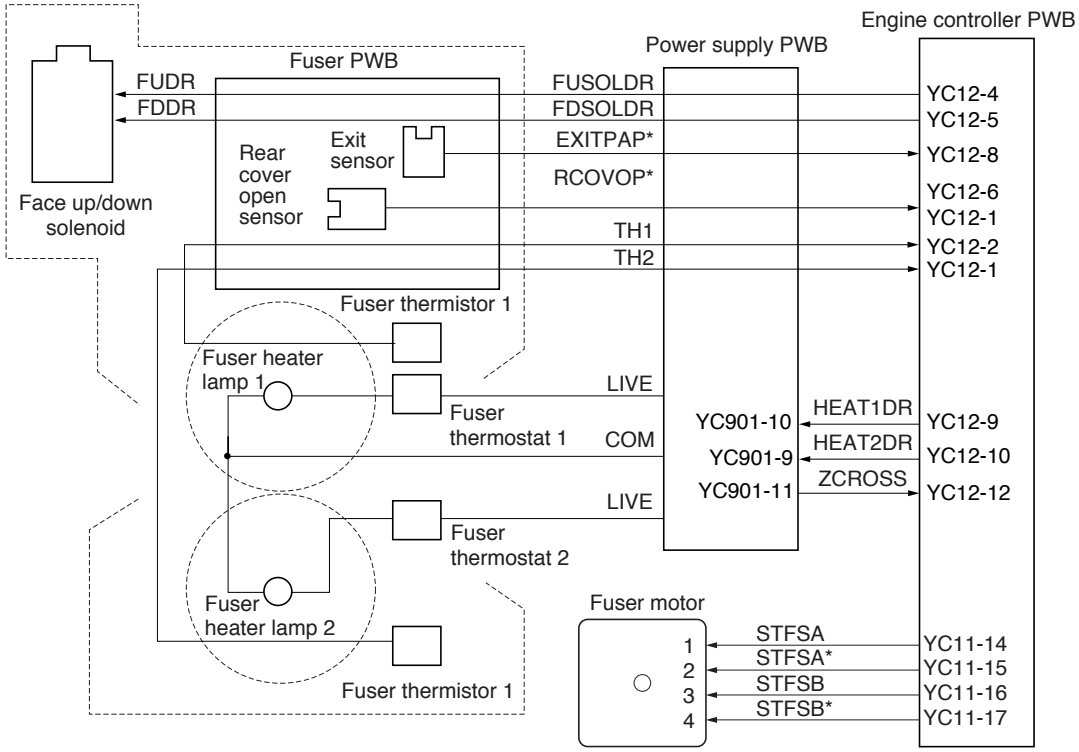


Figure 2-1-36 Fuser unit block diagram

2-2-1 Electrical parts layout

(1) Main frame and controller box

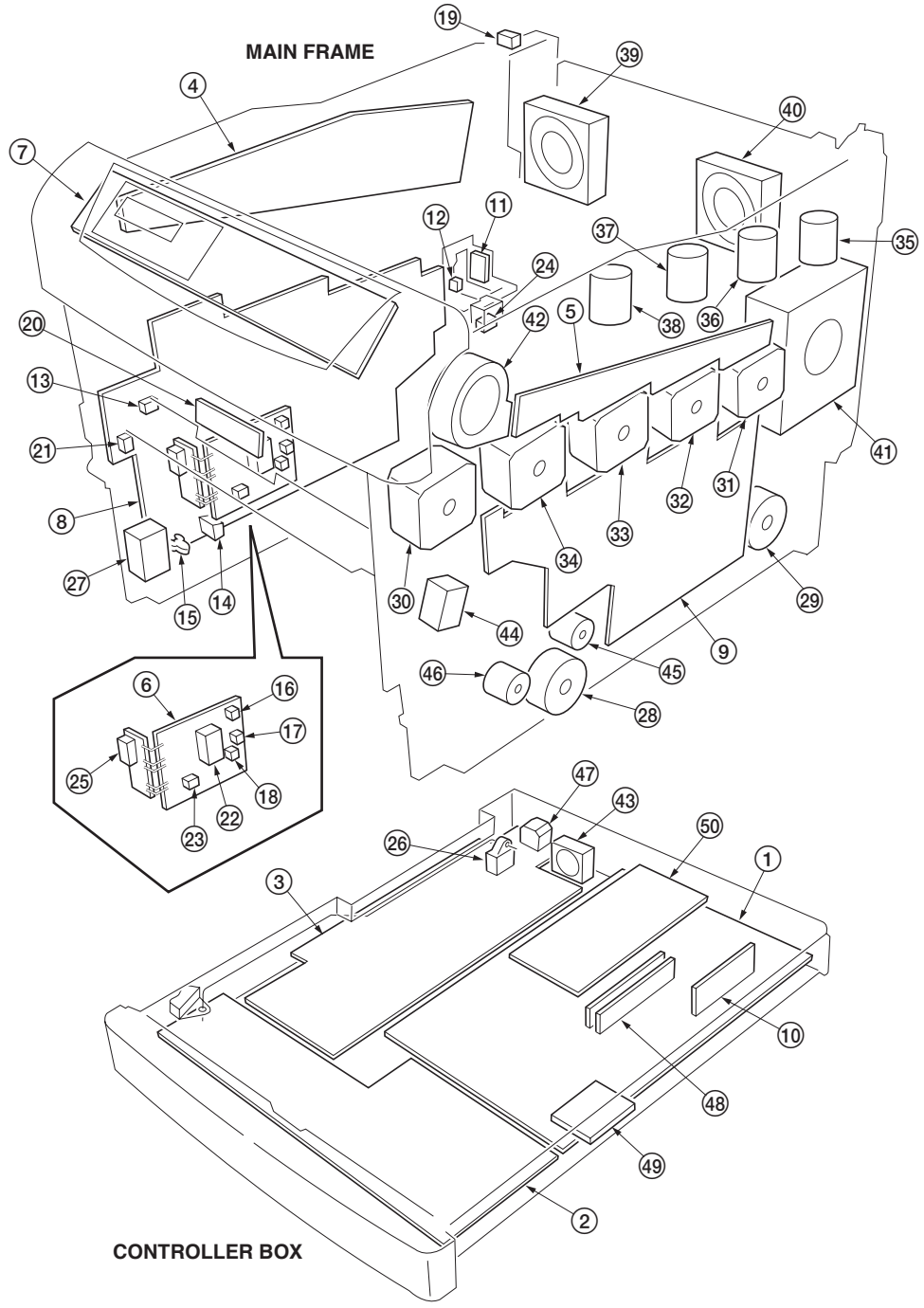


Figure 2-2-1 Main frame and controller box

1. Main controller PWB.....Controls the software such as the print data processing and provides the interface with computers.
2. Engine controller PWB .....Controls printer hardware such as high voltage/bias output control, paper conveying system control, and fuser temperature control, etc.
3. Power supply PWB .....Generates 24 V DC and 5 V DC power source. Controls the fuser heater lamp 1 and 2.
4. LED print head relay PWB.....Consists the LED print head control circuit and wiring relay circuit between engine controller PWB and drum units.
5. Engine relay PWB.....Interconnects the engine controller PWB and the electrical parts.

6. Sensor PWB ..... Consists the top cover/paper feed unit switch, side cover switch, top cover switch 1, paper gauge switch 1/2, registration sensor, and, wiring relay circuit.
7. Operator panel PWB..... Indicates the LCD message display and LED indicators. Controls key inputs.
8. Bias high voltage PWB..... Generates the developing magnet roller bias, developing sleeve bias, and secondary transfer bias
9. Main high voltage PWB..... Generates the main charger high voltage and primary transfer rollers bias.
10. System DIMM PWB ..... System program (firmware).
11. Waste toner full sensor PWB ..... Detects the waste toner box being full.
12. Waste toner full sensor ..... Section of LED light emitting for waste toner detection.
13. MP tray paper sensor..... Detects paper misfeed in the MP tray.
14. Humidity sensor ..... Detects the ambient humidity.
15. Temperature sensor ..... Detects the ambient temperature.
16. Registration sensor ..... Detects the timing of primary feeding.
17. Paper gauge sensor 1..... Detects the paper remaining amount level.
18. Paper gauge sensor 2..... Detects the paper remaining amount level.
19. Paper full sensor ..... Detects whether the face-down tray is full.
20. Toner ID sensor..... Measures image density for color calibration.
21. Envelope feeder install sensor ..... Installing detection of optional envelope feeder.
22. Top cover/feed unit switch ..... Shuts off 24 V power line when the top cover is opened.
23. Top cover switch 1..... Detects the top cover open.
24. Top cover switch 2..... Detects the top cover right side open.
25. Side cover switch ..... Shuts off 24 V power line when the side cover is opened.
26. Power switch ..... Turns ON/OFF the AC power source.
27. Cassette size switch..... Detects the paper size dial setting of the paper setting dial.
28. Feed motor..... Drives the paper feed section.
29. Fuser motor..... Drives the fuser unit and paper exit section.
30. Primary transfer motor ..... Drives the primary transfer unit and primary transfer cleaning unit.
31. Drum motor 1 ..... Drives the magenta drum unit.
32. Drum motor 2 ..... Drives the cyan drum unit.
33. Drum motor 3 ..... Drives the yellow drum unit.
34. Drum motor 4 ..... Drives the black drum unit.
35. Toner motor 1 ..... Replenishes the magenta developer with toner.
36. Toner motor 2..... Replenishes the cyan developer with toner.
37. Toner motor 3..... Replenishes the yellow developer with toner.
38. Toner motor 4..... Replenishes the black developer with toner.
39. Ozone fan motor 1 ..... The exhaust gas of ozone.
40. Ozone fan motor 2 ..... The exhaust gas of ozone.
41. Main fan motor ..... Dissipates heat from the fuser unit.
42. Drum motor cooling fan motor ..... Dissipates heat from the drum motors.
43. Controller box fan motor..... Dissipates heat from the controller box.
44. MP tray feed solenoid ..... Controls the primary paper feed from the MP tray.
45. Registration clutch ..... Controls the second paper feed.
46. Feed clutch..... Controls the paper cassette paper feed.
47. AC inlet..... Connects the AC power source.
48. Expanding memory (optional)..... For expanding main RAM.
49. Expanding memory card (optional)..... Expands the print job function.
50. Expanding board (optional)..... Expands the interface, network interface card or serial interface board.

(2) Drum unit, developer unit and fuser unit

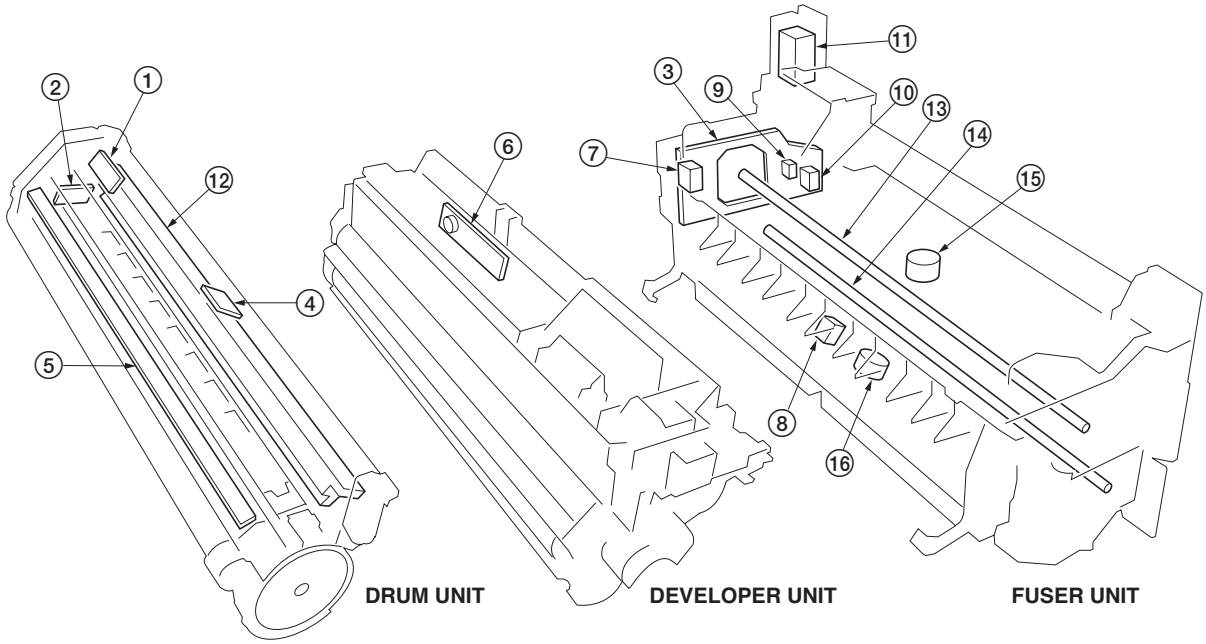


Figure 2-2-2 Drum unit, developer unit and fuser unit

1. Drum PWB 1, 2, 3, 4 ..... Drum PWB 1 (magenta), drum PWB 2 (cyan), drum PWB 3 (yellow), drum PWB 4 (black) wiring relay circuit inside each color drum unit. Drum individual information in EEPROM storage.
2. Zener PWB 1, 2, 3, 4 ..... Adjusts the main charger grid electrostatic potential.
3. Fuser PWB..... Relays wirings from electrical components on the fuser unit.
4. LED print head memory PWB 1, 2, 3, 4..... LED print head memory PWB 1 (magenta), LED print head memory PWB 2 (cyan), LED print head memory PWB 3 (yellow), LED print head memory PWB 4 (black) storage of compensation data of each color LED print head of each drum unit.
5. Eraser lamp 1, 2, 3, 4..... Eliminates the residual electrostatic charge on the drum.
6. Toner sensor 1, 2, 3, 4 ..... Measures the toner concentration in the toner hopper.
7. Fuser thermistor 1..... Detects the temperature of the heat roller.
8. Fuser thermistor 2..... Detects the temperature of the press roller.
9. Exit sensor ..... Detects paper misfeed in the fixing unit.
10. Rear cover open/close sensor ..... Detects the rear cover open.
11. Face up/down solenoid ..... Switches the output stack between face up and face down.
12. LED print head 1, 2, 3, 4..... LED print head 1 (magenta), LED print head 2 (cyan), LED print head 3 (yellow), LED print head 4 (black) lighting of dot light to drum of each color drum unit.
13. Fuser heater lamp 1..... Heats the heat roller.
14. Fuser heater lamp 2..... Heats the press roller.
15. Fuser thermostat 1..... Disable power for the fuser heater lamp 1 in emergency.
16. Fuser thermostat 2..... Disable power for the fuser heater lamp 2 in emergency.

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2-3-1 Power supply PWB

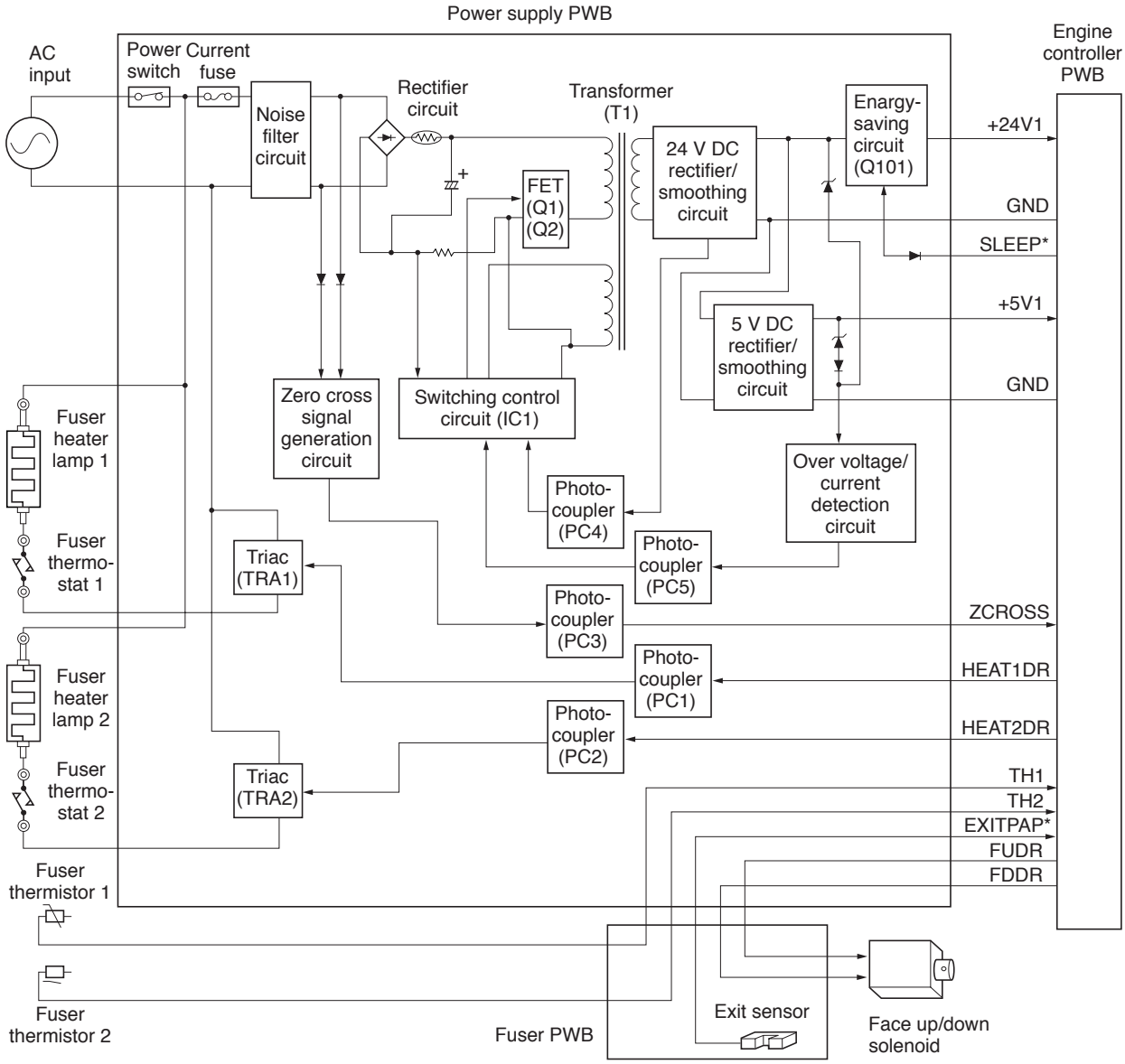

Figure 2-3-1 Power supply PWB block diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
CN1	1	AC100V	I	220 - 240 V AC 120 V AC	AC power input
Connected to the AC inlet	2	-	-	-	Ground
	3	AC100V	I	220 - 240 V AC 120 V AC	AC power output
CN2	1	HEATER LIVE	O	220 - 240 V AC 120 V AC	Fuser heater lamp 1 output
Connected to the AC inlet fuser heater lamp 1 and 2, fuser thermostat 1 and 2	2	NC	-	-	Not Connected
	3	HEATER COM	O	220 - 240 V AC 120 V AC	Fuser heater lamps output (common)
	4	NC	-	-	Not Connected
	5	HEATER LIVE	O	220 - 240 V AC 120 V AC	Fuser heater lamp 2 output
YC901	1	TH1	O	Analog	Fuser thermistor 1 detection voltage output
Connected to the engine controller PWB	2	TH2	O	Analog	Fuser thermistor 2 detection voltage output
	3	FDSOLDR	I	0/24 V DC	Face up/down solenoid control signal
	4	+5V2	O	5 V DC	5 V DC power output
	5	RCOVOP*	O	0/5 V DC	Rear cover open/close sensor: rear cover Open/Close
	6	FUSOLDR	I	0/24 V DC	Face up/down solenoid control signal
	7	EXITPAP*	O	0/5 V DC	Exit sensor: On/Off
	8	+24V2	O	24 V DC	24 V DC power output
	9	HEAT1DR	I	0/24 V DC	Fuser heater lamp 1: On/Off
	10	HEAT2DR	I	0/24 V DC	Fuser heater lamp 2: On/Off
	11	ZCROSS	O	0/5 V DC (pulse)	Zero cross signal output
	12	SLEEP	I	0/24 V DC	Eco-mode control signal input: Normal/Eco-mode
	13	24V1	O	24 V DC	24 V DC power output
	14	24V1	O	24 V DC	24 V DC power output
	15	24V1	O	24 V DC	24 V DC power output
	16	24V1	O	24 V DC	24 V DC power output
	17	GND	-	-	Ground
	18	GND	-	-	Ground
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	GND	-	-	Ground
	22	GND	-	-	Ground
	23	GND	-	-	Ground
	24	GND	-	-	Ground
	25	+3.3V1	I	3.3 V DC	3.3 V DC power input
	26	+3.3V1	I	3.3 V DC	3.3 V DC power input
	27	+3.3V1	I	3.3 V DC	3.3 V DC power input
	28	+3.3V1	I	3.3 V DC	3.3 V DC power input
	29	+5V1	O	5 V DC	5 V DC power output
	30	+5V1	O	5 V DC	5 V DC power output
YC902	1	GND	-	-	Ground
Connected to the fuser PWB	2	+24V2	O	24 V DC	24 V DC power output
	3	FDDR	O	0/24 V DC	Face up/down solenoid control signal
	4	EXITPAP*	I	0/5 V DC	Exit sensor: On/Off
	5	FUSOLDR	O	0/24 V DC	Face up/down solenoid control signal
	6	+5V1	O	5 V DC	5 V DC power output
	6	RCOVOP*	I	0/5 V DC	Rear cover open/close sensor: rear cover Open/Close
	7	TH1	I	Analog	Fuser thermistor 1 detection voltage output
	8	TH2	I	Analog	Fuser thermistor 2 detection voltage output

2-3-2 Engine controller PWB

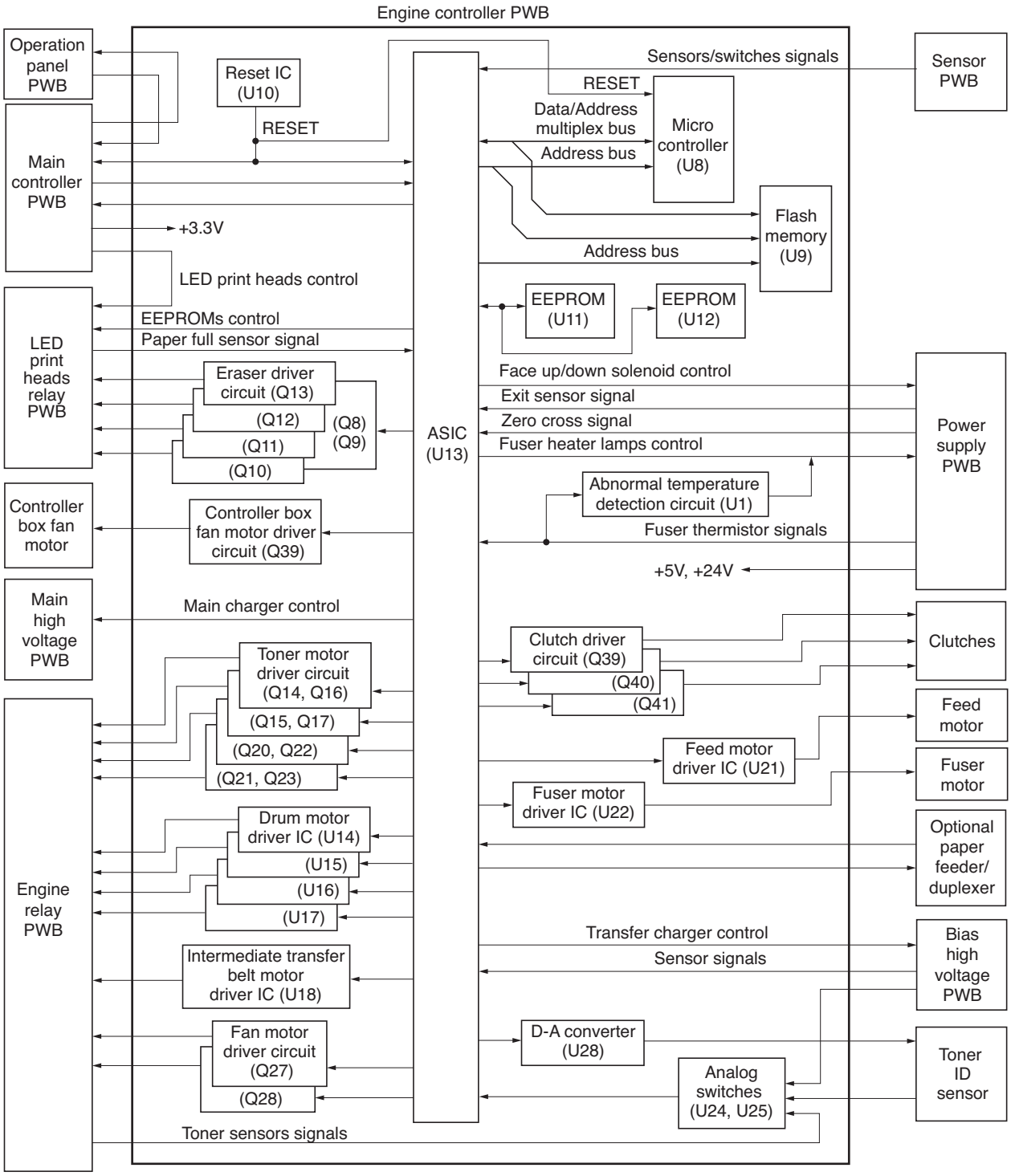

Figure 2-3-2 Engine controller PWB block diagram

(1) Fuser heater lamps control circuit

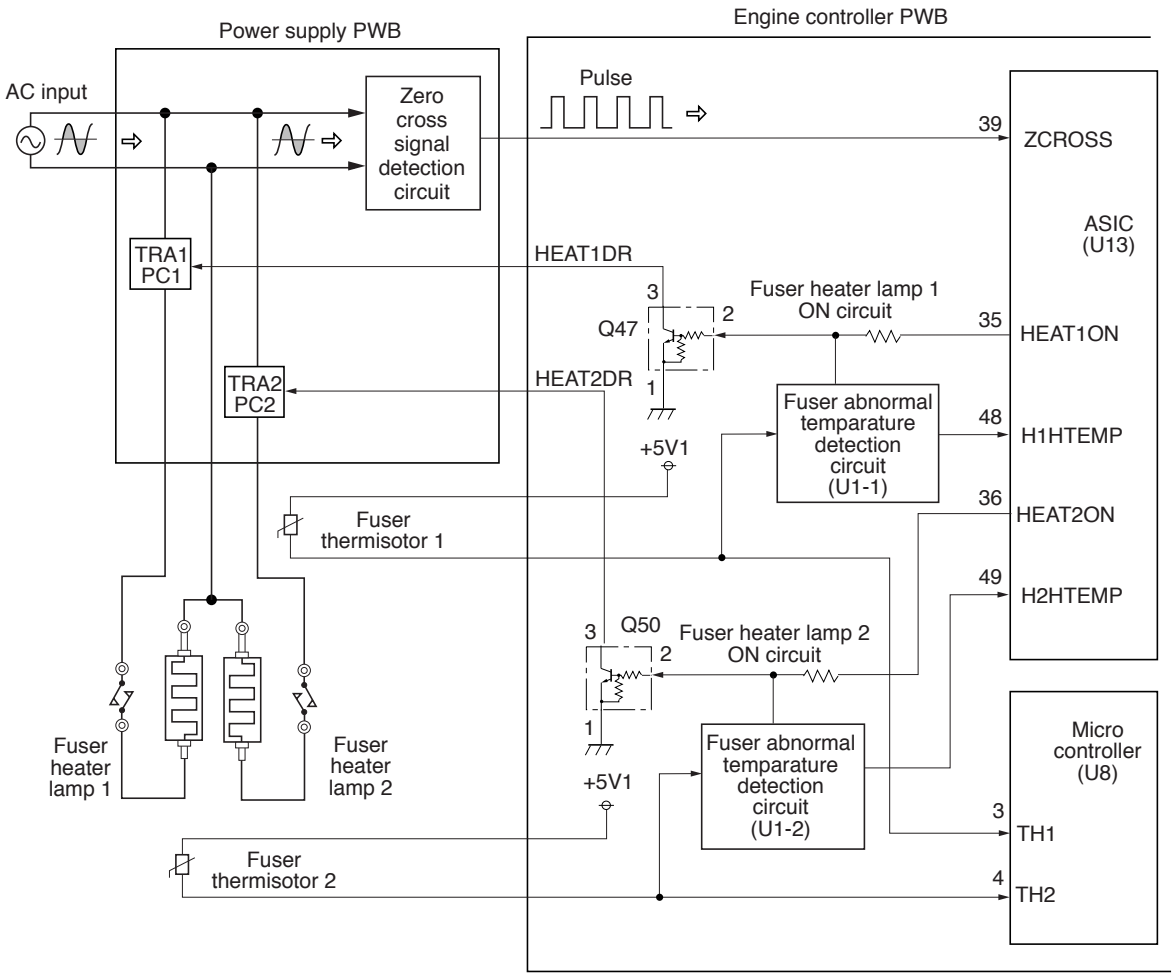

Figure 2-3-3

The ON/OFF action of the fuser heater lamp 1 and 2 are controlled by the fuser heater lamp 1 and 2 lighting ON signals (HEAT1ON, HEAT2ON) output from the No.35 and 36 pin of ASIC (U13) of the engine controller PWB. When the HEAT1ON and HEAT2ON signals reach the H level, the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) turn on because the transistors (Q47, Q50) turn on and then the AC voltage is loaded to the fuser heater lamps. The HEAT1ON and HEAT2ON signals turn ON/OFF the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) being synchronized with the zero cross signal (ZCROSS) that is detected by the zero cross signal detection circuit on the power supply PWB. The ZCROSS signal detects the zero cross point (0V) where the AC power source changes between positive/negative domains and it is input to the No.39 pin of the ASIC (U13) of the engine/high voltage PWB. Since the ON/OFF operation of the photocouplers (PC1, PC2) and triacs (TRA1, TRA2) are performed at the zero cross point (0V), it can avoid the sharp change of current and restrain noises generated from the AC power source.The fuser thermistor detection voltages (TH1, TH2) are input to the micro controller (U8) and branched to input to the comparator (U1-1, U1-2). The comparator (U1-1, U1-2) compares the TH1 and TH2 signals voltage with the unusually high temperature voltage. If the voltage TH1 and TH2 signals voltage are higher than unusually high temperature voltage, the output level is L. For the HEAT1ON and HEAT2ON signals, the circuit that forcibly turns off the fuser heater lamps by the hardware-based method and forcibly makes the HEAT1ON and HEAT2ON signals to L level regardless of controls by ASIC (U13) is provided fuser heater lamp ON signals (HEAT1ON, HEAT2ON).
This circuit is provided for the purpose of fail safe, it usually monitors the unusual high temperature in the software system by the input voltage of the TH1 and TH2 signals that are input to the No.3 and 4 pin of micro controller (U8), therefore, the circuit operates the control to turn off the fuser heater lamps before the mentioned circuit is activated and stops the machine, and then indicates the error code 6020 or 6120 that shows the fuser high temperature failure according to the self diagnosis function.

(2) Interlock and 24 V DC power supply circuit

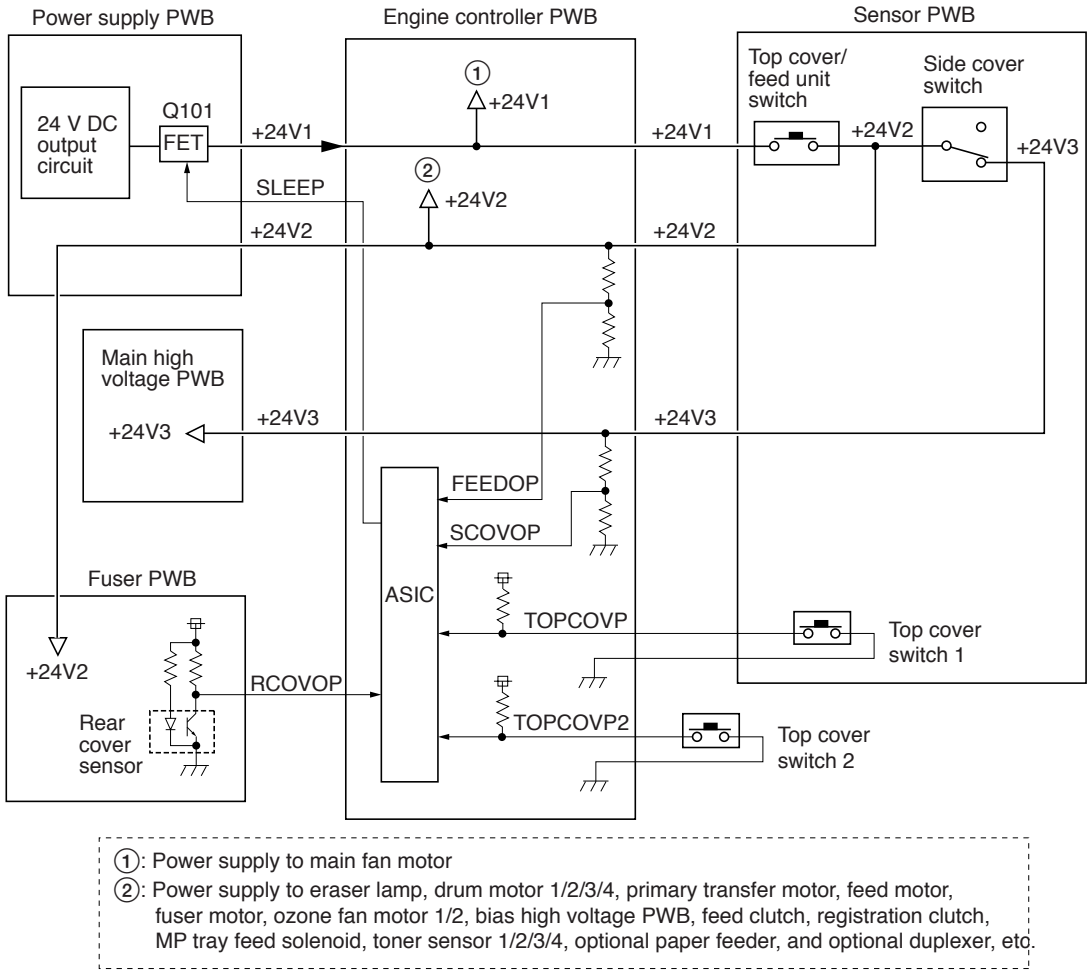
Power supply PWB
Engine controller PWB
Sensor PWB
24 V DC output circuit
Q101
FET
+24V1
SLEEP
+24V2
Top cover/ feed unit switch
Side cover switch
+24V3
Main high voltage PWB
FEEDOP
SCOVOP
ASIC
Fuser PWB
TOPCOVP
Top cover switch 1
RCOVOP
Rear cover sensor
TOPCOVP2
Top cover switch 2
①: Power supply to main fan motor
②: Power supply to eraser lamp, drum motor 1/2/3/4, primary transfer motor, feed motor, fuser motor, ozone fan motor 1/2, bias high voltage PWB, feed clutch, registration clutch, MP tray feed solenoid, toner sensor 1/2/3/4, optional paper feeder, and optional duplexer, etc.

Figure 2-3-4

The 24 V DC power source line is shut off by the top cover/feed unit switch or the side cover switch that is turned OFF when the top cover or the side cover is opened. At the same time, the 24 V DC power supply is stopped to the motor and clutch and it is also output to the ASIC of the engine controller PWB as the cover open detection signal.
The 24 V DC power is divided into five groups of +24V1, +24V2, and +24V3 as figure 2-3-4, and the loads that supply the 24 V DC power source or the cover open detection signals are different.
In the Eco-power mode, the circuit shuts off the +24V power source that is used by the printer unit in order to reduce the power consumption. In the Eco-power mode, the sleep signal (SLEEP) becomes L level, which is output from the CPU of the engine controller PWB. The signal at this level turns off the transistors (Q101) of the Eco-circuit, accordingly the supply of +24V1 to the power line is shut off and the operation of connected load will stop.

Connector	Pin No.	Signal	I/O	Voltage	Description
YC2	1	+24V1	O	24 V DC	24 V DC power output
Connected to the sensor PWB	2	+24V1	O	24 V DC	24 V DC power output
	3	+24V1	O	24 V DC	24 V DC power output
	4	+24V1	O	24 V DC	24 V DC power output
	5	GND	-	-	Ground
	6	GND	-	-	Ground
	7	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	8	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	9	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	10	+5V2	O	5 V DC	5 V DC power output
	11	REGPAP*	I	0/5 V DC	Registration sensor: On/Off
	12	PAPVOL0	I	0/5 V DC	Paper gauge sensor 1: On/Off
	13	PAPVOL1	I	0/5 V DC	Paper gauge sensor 2: On/Off
	14	TCOVOP	I	0/5 V DC	Top cover switch 1: Top cover Close/Open
	15	CAS0	I	0/5 V DC	Cassette size switch (lower button: On/Off)
	16	CAS1	I	0/5 V DC	Cassette size switch (middle button: On/Off)
	17	CAS2	I	0/5 V DC	Cassette size switch (upper button: On/Off)
	18	+24V3	I	24 V DC	24 V DC power output (via side cover switch)
YC3	1	GND	-	-	Ground
Connected to the LED print head relay PWB	2	EECLK	O	0/5 V DC (pulse)	Clock for EEPROM data reading and writing
	3	ERS1DR	O	0/24 V DC	Eraser lamp 1 (black): On/Off
	4	EEDATA	I/O	0/5 V DC (pulse)	EEPROM data signal
	5	ERS2DR	O	0/24 V DC	Eraser lamp 2 (yellow): On/Off
	6	ERS3DR	O	0/24 V DC	Eraser lamp 3 (cyan): On/Off
	7	+5V1	O	5 V DC	5 V DC power output
	8	ERS4DR	O	0/24 V DC	Eraser lamp 4 (magenta): On/Off
	9	+5V1	O	5 V DC	5 V DC power output
	10	RD	O	0/5 V DC	LED print head control signal
	11	LVDSP0	O	Analog	LED print head control video data signal (LVDS)
	12	LVDSN0	O	Analog	LED print head control video data signal (LVDS)
	13	LVDSP1	O	Analog	LED print head control video data signal (LVDS)
	14	LVDSN1	O	Analog	LED print head control video data signal (LVDS)
	15	LVDSP2	O	Analog	LED print head control video data signal (LVDS)
	16	LVDSN2	O	Analog	LED print head control video data signal (LVDS)
	17	LVDSP3	O	Analog	LED print head control video data signal (LVDS)
	18	LVDSN3	O	Analog	LED print head control video data signal (LVDS)
	19	LVDSP4	O	Analog	LED print head control video data signal (LVDS)
	20	LVDSN4	O	Analog	LED print head control video data signal (LVDS)
	21	LVDSP5	O	Analog	LED print head control video data signal (LVDS)
	22	LVDSN5	O	Analog	LED print head control video data signal (LVDS)
	23	LVDSP6	O	Analog	LED print head control video data signal (LVDS)
	24	LVDSN6	O	Analog	LED print head control video data signal (LVDS)
	25	LVDSP7	O	Analog	LED print head control video data signal (LVDS)
	26	LVDSN7	O	Analog	LED print head control video data signal (LVDS)
	27	LVDSP8	O	Analog	LED print head control video data signal (LVDS)
	28	LVDSN8	O	Analog	LED print head control video data signal (LVDS)
	29	LVDSP9	O	Analog	LED print head control video data signal (LVDS)
	30	LVDSN9	O	Analog	LED print head control video data signal (LVDS)
	31	LVDSP10	O	Analog	LED print head control video data signal (LVDS)
	32	LVDSN10	O	Analog	LED print head control video data signal (LVDS)
	33	LVDSP11	O	Analog	LED print head control video data signal (LVDS)
	34	LVDSN11	O	Analog	LED print head control video data signal (LVDS)
	35	LVDSP12	O	Analog	LED print head control video data signal (LVDS)
	36	LVDSN12	O	Analog	LED print head control video data signal (LVDS)
	37	LVDSP13	O	Analog	LED print head control video data signal (LVDS)
	38	LVDSN13	O	Analog	LED print head control video data signal (LVDS)

Connector	Pin No.	Signal	I/O	Voltage	Description
YC3	39	LVDSP14	O	Analog	LED print head control video data signal (LVDS)
Connected to the LED print head relay PWB	40	LVDSN14	O	Analog	LED print head control video data signal (LVDS)
	41	LVDSP15	O	Analog	LED print head control video data signal (LVDS)
	42	LVDSN15	O	Analog	LED print head control video data signal (LVDS)
	43	+5V1	O	5 V DC	5 V DC power output
	44	FDPFUL*	I	0/5 V DC	Paper full sensor: On/Off
	45	+5V1	O	5 V DC	5 V DC power output
	46	+5V1	O	5 V DCV	5 V DC power output
	47	GND	-	-	Ground
	48	GND	-	-	Ground
	49	GND	-	-	Ground
	50	GND	-	-	Ground
YC4	1	ST4A	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
Connected to the engine relay PWB	2	STMIDB*	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	3	ST4B	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	4	STMIDA*	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	5	ST4A*	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	6	STMIDB*	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	7	ST4B*	O	0/24 V DC (pulse)	Drum motor 4 (black) energization pulse
	8	STMIDA	O	0/24 V DC (pulse)	Primary transfer motor energization pulse
	9	TNM4DR	O	0/24 V DC	Toner motor 4 (black): On/Off
	10	TNSEN4	I	Analog	Toner sensor 4 (black) detection voltage input
	11	TNSEN3	I	Analog	Toner sensor 3 (yellow) detection voltage input
	12	ST3B*	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	13	TNM3DR	O	DC0V/24V	Toner motor 3 (yellow): On/Off
	14	ST3A*	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	15	+24V2	O	24 V DC	24 V DC power output
	16	ST3B	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	17	+24V2	O	24 V DC	24 V DC power output
	18	ST3A	O	0/24 V DC (pulse)	Drum motor 3 (yellow) energization pulse
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	TNSEN2	I	Analog	Toner sensor 2 (cyan) detection voltage input
	22	HFANDR	O	0/24 V DC	Main fan motor: On/Off
	23	TNM2DR	O	0/24 V DC	Toner motor 2 (cyan): On/Off
	24	OZFANDR	O	0/24 V DC	Ozone fan motor 1, ozone fan motor 2 and, drum motors cooling fan motor: On/Off
	25	TNSEN1	I	Analog	Toner sensor 1 (magenta) detection voltage input
	26	TNM1DR	O	0/24 V DC	Toner motor 1 (magenta): On/Off
	27	ST2A	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	28	ST1B*	O	24 V DC	Drum motor 1 (magenta) energizatione pulse
	29	ST2B	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	30	ST1A*	O	24 V DC	Drum motor 1 (magenta) energization pulse
	31	ST2A*	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	32	ST1B	O	0/24 V DC (pulse)	Drum motor 1 (magenta) energization pulse
	33	ST2B*	O	0/24 V DC (pulse)	Drum motor 2 (cyan) energization pulse
	34	ST1A	O	0/24 V DC (pulse)	Drum motor 1 (magenta) energization pulse
YC5	1	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
Connected to the bias high voltage PWB	2	HVCLK1	O	3KHz rectangular wave	Developing sleeve (magenta) output
	3	HVCLK2	O	3KHz rectangular wave	Developing sleeve (cyan) output
	4	HVCLK3	O	3KHz rectangular wave	Developing sleeve (yellow) output
	5	HVCLK4	O	3KHz rectangular wave	Developing sleeve (black) output
	6	HVADATD	O	0/5 V DC (pulse)	Output control D/A converter serial signal
	7	HVACLKD	O	0/5 V DC (pulse)	Output control D/A converter clock signal
	8	HVALATD	O	0/5 V DC (pulse)	Output control D/A converter data latch signal
	9	GND	-	-	Ground

Connector	Pin No.	Signal	I/O	Voltage	Description
YC5	10	+5V1	O	5 V DC	5 V DC power output
Connected to the bias high voltage PWB	11	MPFSENS1	I	0/5 V DC	MP tray paper sensor: On/Off
	12	MPFSENS2	I	0/5 V DC	Envelope feeder install sensor: Installed/Not installed
	13	WTLEDDR	O	0/5 V DC (pulse)	Waste toner full sensor (emitter) drive output
	14	WTSENS	I	0/5 V DC (pulse)	Waste toner full sensor (receiver) input, Full at voltage above the 2 V DC
	15	AIRTEMP	I	Analog	Temperature sensor detection voltage input
	16	WETCK1	O	0/5 V DC (pulse)	Humidity sensor control signal (1 KHz)
	17	WETCK2	I	Analog	Temperature sensor detection signal
YC6	1	+24V3	I	24 V DC	24 V DC power input (via side cover switch)
Connected to the main high voltage PWB	2	MCH1DR	O	0/24 V DC	Main charger output control signal (Magenta): On/Off
	3	MCH2DR	O	0/24 V DC	Main charger output control signal (Cyan): On/Off
	4	MCH3DR	O	0/24 V DC	Main charger output control signal (Yellow): On/Off
	5	MCH4DR	O	0/24 V DC	Main charger output control signal (Black): On/Off
	6	+5V1	O	5 V DC	5 V DC power output
	7	HVADATD	O	0/5 V DC (pulse)	Output control D/A converter serial signal
	8	HVACLKD	O	0/5 V DC (pulse)	Output control D/A converter clock signal
	9	HVALATD	O	0/5 V DC (pulse)	Output control D/A converter data latch signal
	10	GND	-	-	Ground
YC7	1	GND	-	-	Ground
Connected to the optional paper feeder/ duplexer	2	OPRDY*	I	0/5 V DC	Optional unit ready signal: Ready/Not ready
	3	OPSEL2	O	0/5 V DC	Optional unit select signal: (bit2)
	4	OPSDO	O	0/5 V DC (pulse)	Optional unit serial communication data output
	5	OPSEL1	O	0/5 V DC	Optional unit select signal: (bit1)
	6	OPSDI	I	0/5 V DC (pulse)	Optional unit serial communication data input
	7	OPSEL0	O	0/5 V DC	Optional unit select signal: (bit0)
	8	OPSCLK	O	0/5 V DC (pulse)	Optional unit serial communication clock signal
	9	NC	-	-	Not connected
	10	OP5V	O	5 V DC	5 V DC power output (via fuse)
	11	GND	-	-	Ground
	12	OP24V	O	24 V DC	5 V DC power output (via fuse)
YC8	1	+3.3V1	I	3.3 V DC	3.3 V DC power output
Connected to the main controller PWB	2	+3.3V1	I	3.3 V DC	3.3 V DC power output
	3	+2.5V1	O	3.3 V DC	3.3 V DC power output
	4	+2.5V1	O	3.3 V DC	3.3 V DC power output
	5	GND	-	-	Ground
	6	LVDSN15	I	Analog	LED print head control video data signal (LVDS)
	7	LVDSN14	I	Analog	LED print head control video data signal (LVDS)
	8	LVDSN13	I	Analog	LED print head control video data signal (LVDS)
	9	LVDSN12	I	Analog	LED print head control video data signal (LVDS)
	10	LVDSN11	I	Analog	LED print head control video data signal (LVDS)
	11	LVDSN10	I	Analog	LED print head control video data signal (LVDS)
	12	LVDSN9	I	Analog	LED print head control video data signal (LVDS)
	13	LVDSN8	I	Analog	LED print head control video data signal (LVDS)
	14	LVDSN7	I	Analog	LED print head control video data signal (LVDS)
	15	LVDSN6	I	Analog	LED print head control video data signal (LVDS)
	16	LVDSN5	I	Analog	LED print head control video data signal (LVDS)
	17	LVDSN4	I	Analog	LED print head control video data signal (LVDS)
	18	LVDSN3	I	Analog	LED print head control video data signal (LVDS)
	19	LVDSN2	I	Analog	LED print head control video data signal (LVDS)
	20	LVDSN1	I	Analog	LED print head control video data signal (LVDS)
	21	LVDSN0	I	Analog	LED print head control video data signal (LVDS)
	22	RD	I	0/5 V DC	LED print head control signal
	23	GND	-	-	Ground
	24	SCLKIN	I	0/5 V DC (pulse)	Serial communication synchronizing clock signal
	25	SYSRES*	O	0/5 V DCC	System reset signal
	26	SIOUT	O	0/5 V DC (pulse)	Serial communication data output
	27	GND	-	-	Ground
	28	GND	-	-	Ground

Connector	Pin No.	Signal	I/O	Voltage	Description
YC8	29	FPRST*	O	0/5 V DC	Operation panel PWB reset signal
Connected to the main controller PWB	30	GND	-	-	Ground
	31	+5V1	O	5 V DC	5 V DC power output
	32	+2.5V1	I	2.5 V DC	2.5 V DC power input
	33	+2.5V1	I	2.5 V DC	2.5 V DC power input
	34	+2.5V1	I	2.5 V DC	2.5 V DC power input
	35	GND	-	-	Ground
	36	LVDSP15	I	Analog	LED print head control video data signal (LVDS)
	37	LVDSP14	I	Analog	LED print head control video data signal (LVDS)
	38	LVDSP13	I	Analog	LED print head control video data signal (LVDS)
	39	LVDSP12	I	Analog	LED print head control video data signal (LVDS)
	40	LVDSP11	I	Analog	LED print head control video data signal (LVDS)
	41	LVDSP10	I	Analog	LED print head control video data signal (LVDS)
	42	LVDSP9	I	Analog	LED print head control video data signal (LVDS)
	43	LVDSP8	I	Analog	LED print head control video data signal (LVDS)
	44	LVDSP7	I	Analog	LED print head control video data signal (LVDS)
	45	LVDSP6	I	Analog	LED print head control video data signal (LVDS)
	46	LVDSP5	I	Analog	LED print head control video data signal (LVDS)
	47	LVDSP4	I	Analog	LED print head control video data signal (LVDS)
	48	LVDSP3	I	Analog	LED print head control video data signal (LVDS)
	49	LVDSP2	I	Analog	LED print head control video data signal (LVDS)
	50	LVDSP1	I	Analog	LED print head control video data signal (LVDS)
	51	LVDSP0	I	Analog	LED print head control video data signal (LVDS)
	52	BDMASK	O	Analog	LED print head control video data signal (LVDS)
	53	GND	-	-	Ground
	54	SIIN	I	0/3.3 V DC (pulse)	Serial communication data output
	55	SDIR	O	0/3.3 V DC	Control signal
	56	SBSY*	O	0/3.3 V DC	Control signal
	57	EGIR	O	0/3.3 V DC	Control signal
	58	FPCLK	O	0/3.3 V DC (pulse)	Operation panel PWB control data synchronizing clock signal
	59	FPDATA	I/O	0/3.3 V DC (pulse)	Operation panel PWB control data signal
	60	FPDIR	O	0/3.3 V DC	Operation panel PWB communication direction control signal
YC10	1	+3.3V1	O	3.3 V DC	3.3 V DC power output
Connected to the operation panel PWB	2	FPDATA	I/O	0/3.3 V DC (pulse)	Operation panel PWB control data signal
	3	FPDIR	I	0/3.3 V DC	Operation panel PWB communication direction control signal
	4	FPCLK	I	0/3.3 V DC (pulse)	Operation panel PWB communication direction control signal
	5	GND	-	-	Ground
	6	FPRST*	O	DC0V/5V	Operation panel PWB reset signal
YC11	1	TCOV0P2	I	DC0V/5V	Top cover switch: Top cover Close/Open
Connected to the registration clutch, feed clutch, MP tray feed solenoid, toner ID sensor, feed motor and, fuser motor	2	GND	-	-	Ground
	3	+24V2	O	24 V DC	24 V DC power (via top cover/paper feed unit switch)
	4	REGCLDR	O	0/24 V DC	Registration clutch: On/Off
	5	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	6	FEDCLDR	O	0/24 V DC	Feed clutch: On/Off
	7	+24V2	O	24 V DC	24 V DC power output (via top cover/paper feed unit switch)
	8	MPSOLDR	O	0/24 V DC	MP tray feed solenoid: On/Off
	9	+5V1	O	5 V DC	5 V DC power
	10	GND	-	-	Ground
	11	IDSW	I	Analog	Toner ID sensor detection voltage (S-wave) input
	12	IDSW	I	Analog	Toner ID sensor detection voltage (P-wave) input
	13	IDREF	O	Analog	Toner ID sensor LED light emitting control signal
	14	STFDA	O	0/24 V DC (pulse)	Feed motor energization pulse
	15	STFDA*	O	0/24 V DC (pulse)	Feed motor energization pulse
	16	STFDB	O	0/24 V DC (pulse)	Feed motor energization pulse

Connector	Pin No.	Signal	I/O	Voltage	Description
YC11	17	STFDB*	O	0/24 V DC (pulse)	Feed motor energization pulse
Connected to the registration clutch, feed clutch, MP tray feed solenoid, toner ID sensor, feed motor and, fuser motor	18	STFSA	O	0/24 V DC (pulse)	Fuser motor energization pulse
	19	STFSA*	O	0/24 V DC (pulse)	Fuser motor energization pulse
	20	STFSB	O	0/24 V DC (pulse)	Fuser motor energization pulse
	21	STFSB*	O	0/24 V DC (pulse)	Fuser motor energization pulse
	22	GND	-	-	Ground
YC12	1	TH1	I	Analog	Fuser thermistor 1 detection voltage input
Connected to the power supply PWB	2	TH2	I	Analog	Fuser thermistor 2 detection voltage input
	3	FDSOLDR	O	0/24 V DC (pulse)	Face up/down solenoid control signal
	4	+5V2	I	5 V DC	5 V DC power input
	5	RCOVOP*	O	0/5 V DC	Rear cover open/close sensor: rear cover open/close
	6	FUSOLDR	O	0/24 V DC	Face up/down solenoid control signal
	7	EXITPAP*	I	0/5 V DC	Exit sensor: On/Off
	8	+24V2	I	24 V DC	24 V DC power output
	9	HEAT2DR	O	0/24 V DC	Fuser heater lamp 1: On/Off
	10	HEAT1DR	O	0/24 V DC	Fuser heater lamp 2: On/Off
	11	ZCROSS	I	0/5 V DC (pulse)	Zero cross signal input
	12	SLEEP	O	0/24 V DC	Eco-mode control signal output: Normal/Eco-mode
	13	24V1	I	24 V DC	24 V DC power input
	14	24V1	I	24 V DC	24 V DC power input
	15	24V1	I	24 V DC	24 V DC power input
	16	24V1	I	24 V DC	24 V DC power input
	17	GND	-	-	Ground
	18	GND	-	-	Ground
	19	GND	-	-	Ground
	20	GND	-	-	Ground
	21	GND	-	-	Ground
	22	GND	-	-	Ground
	23	GND	-	-	Ground
	24	GND	-	-	Ground
	25	+3.3V1	O	3.3 V DC	3.3 V DC power output
	26	+3.3V1	O	3.3 V DC	3.3 V DC power output
	27	+3.3V1	O	3.3 V DC	3.3 V DC power output
	28	+3.3V1	O	3.3 V DC	3.3 V DC power output
	29	+5V1	I	5 V DC	5 V DC power input
	30	+5V1	I	5 V DC	5 V DC power input
YC13	1	BFANDR	O	0/5 V DC	Controller box fan motor: On/Off
Connected to the controller box fan motor	2	GND	-	-	Ground

2-3-3 Main controller circuit

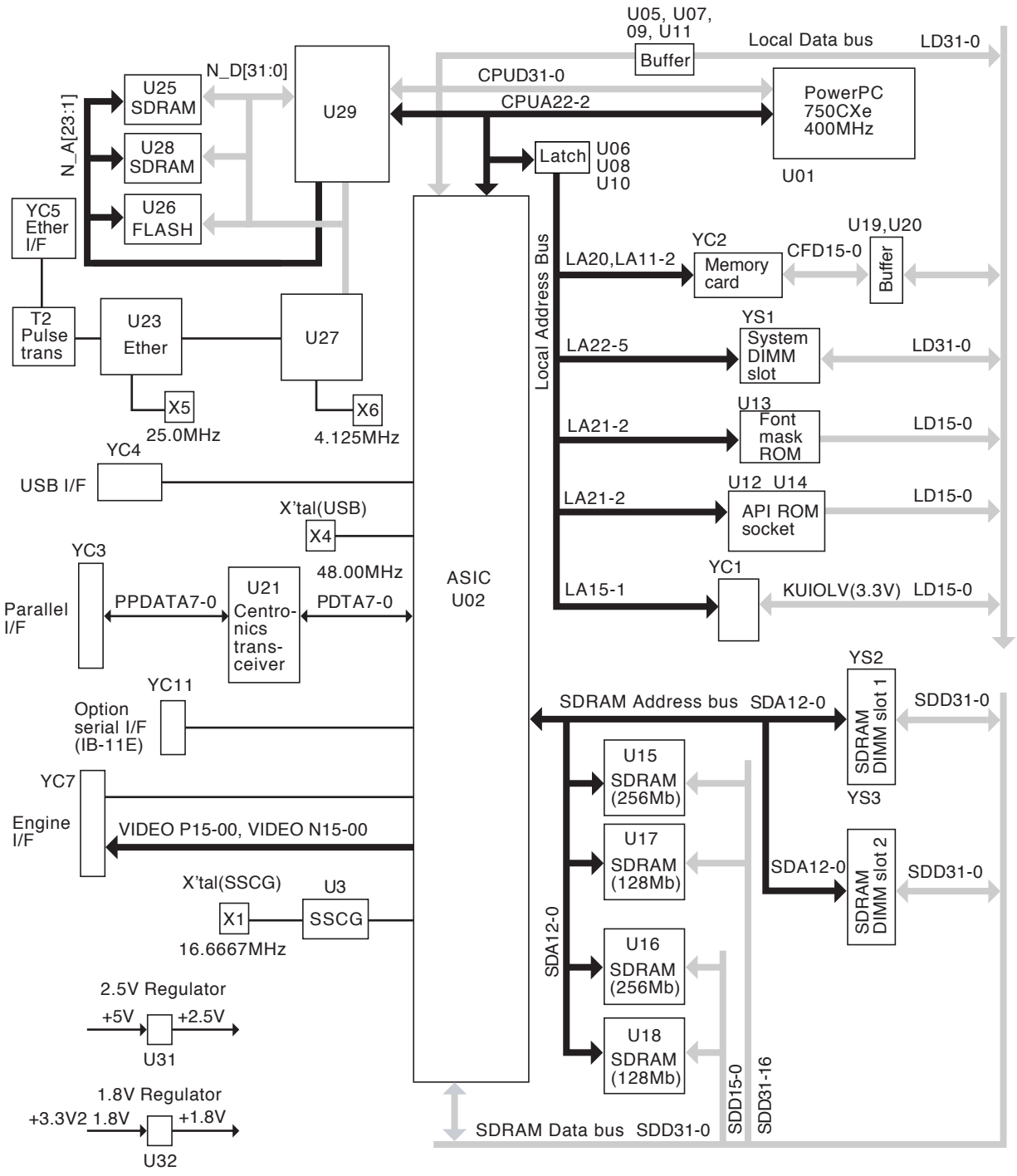

Figure 2-3-5 Main controller circuit block diagram

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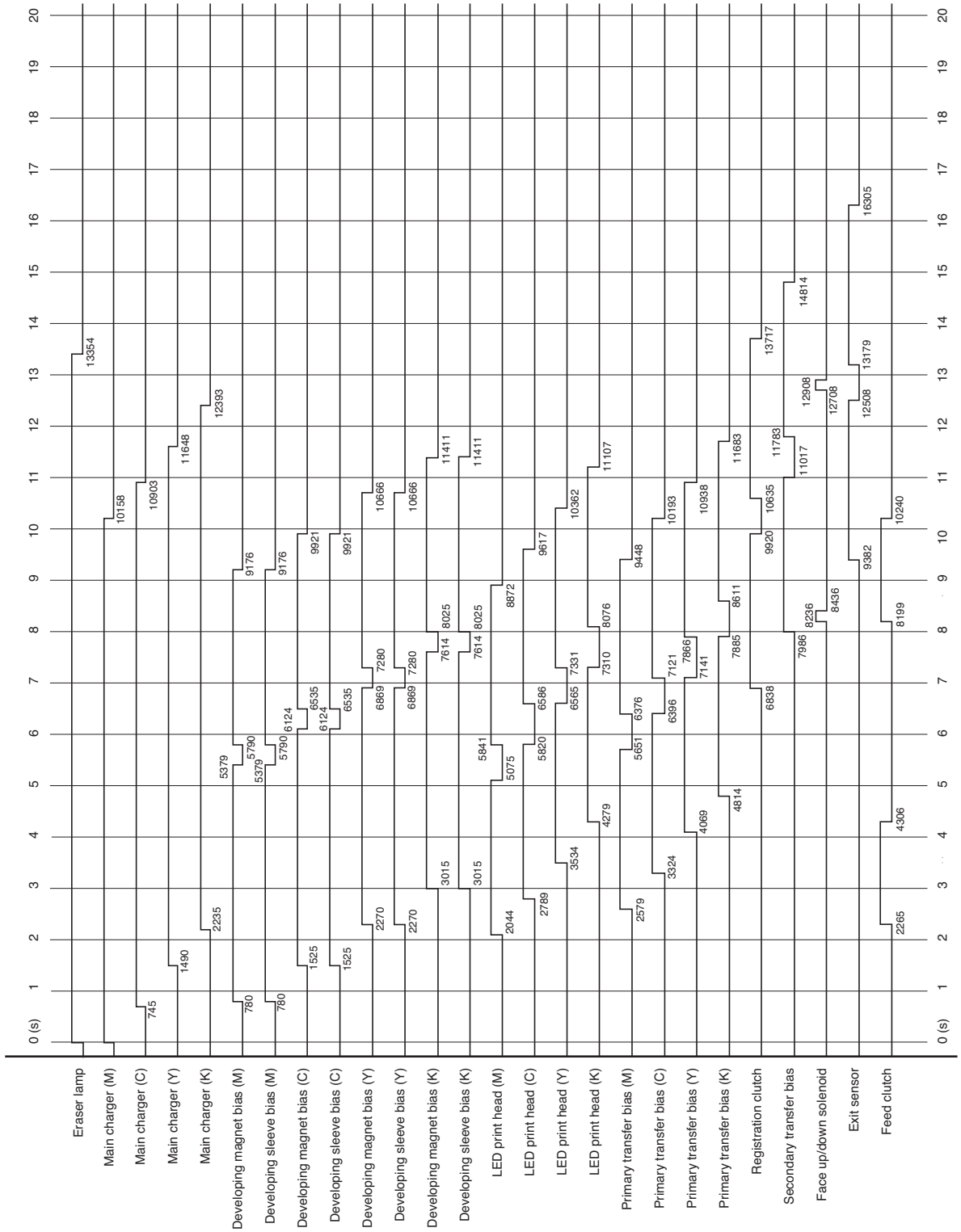
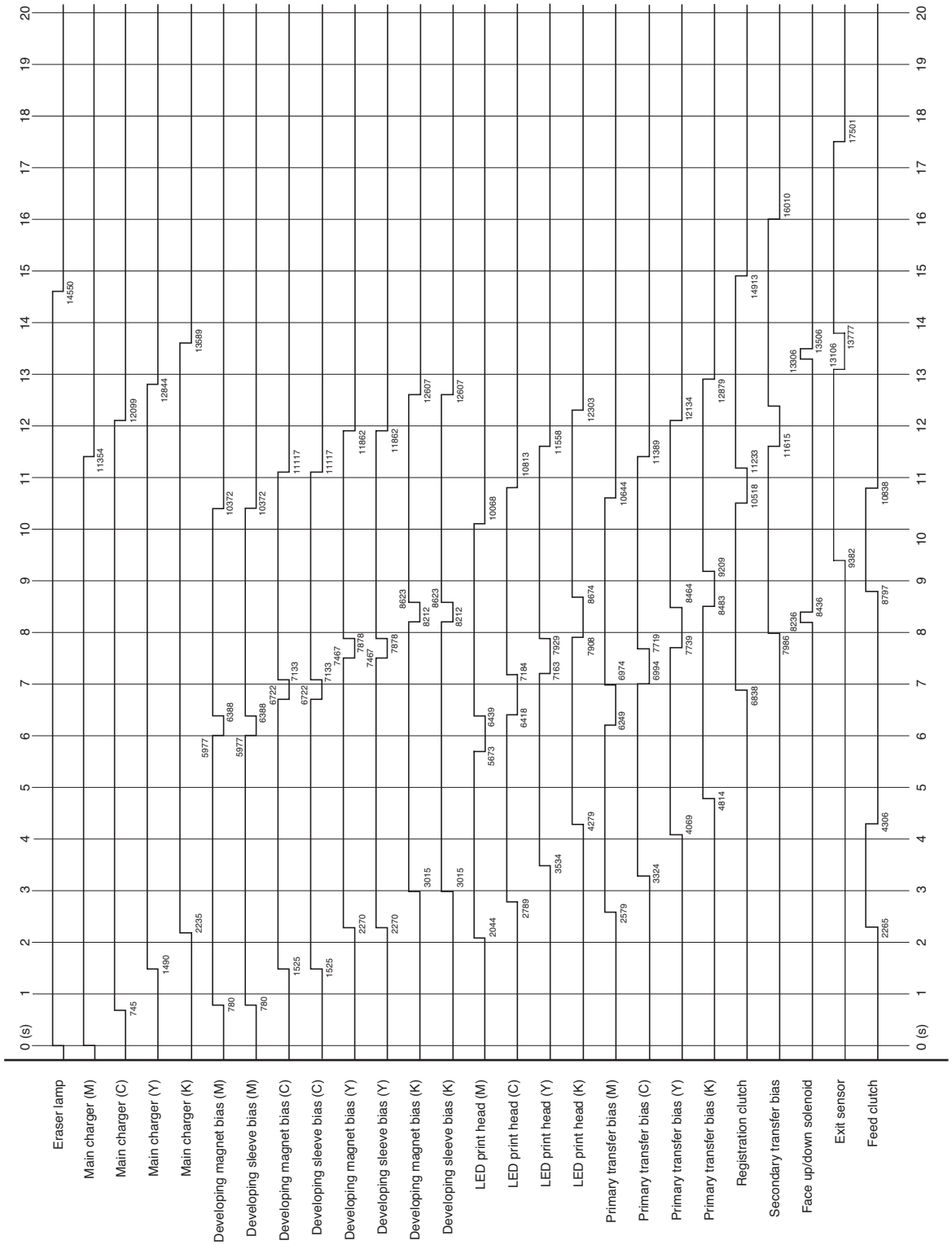
2-4-1 Appendixes

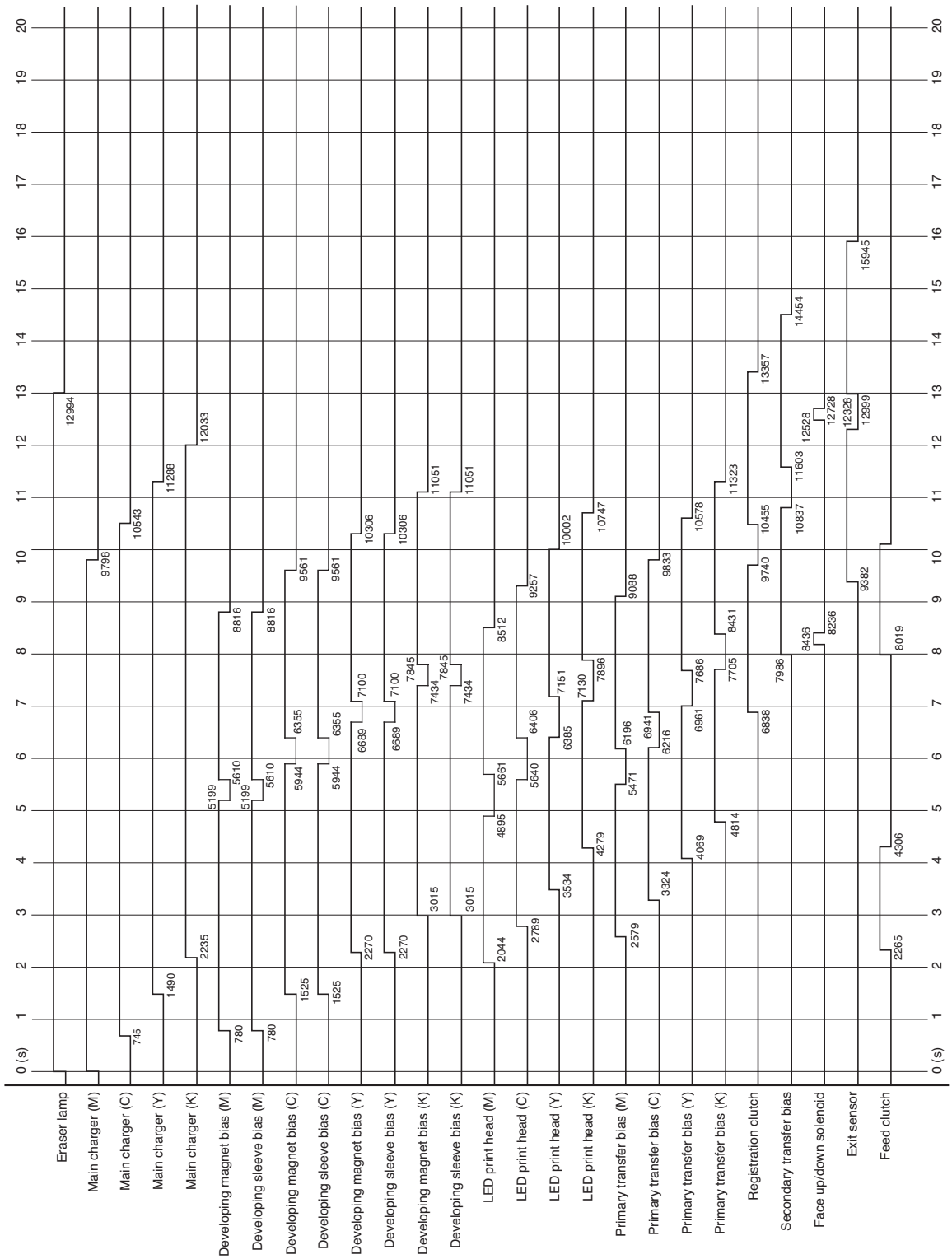
(1) Timing chart No. 1 Paper cassette, A4 size



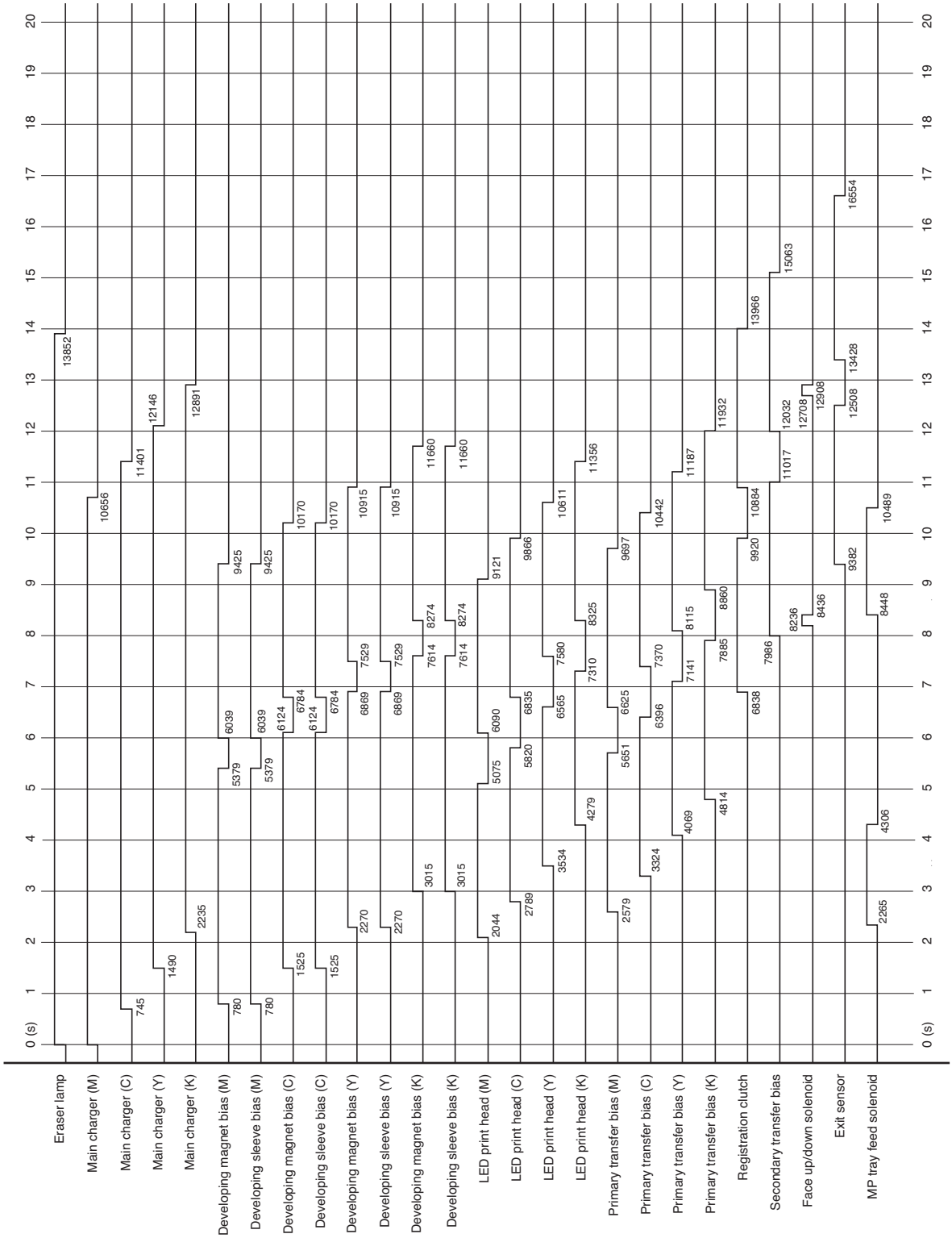
(2) Timing chart No. 2 Paper cassette, Legal size



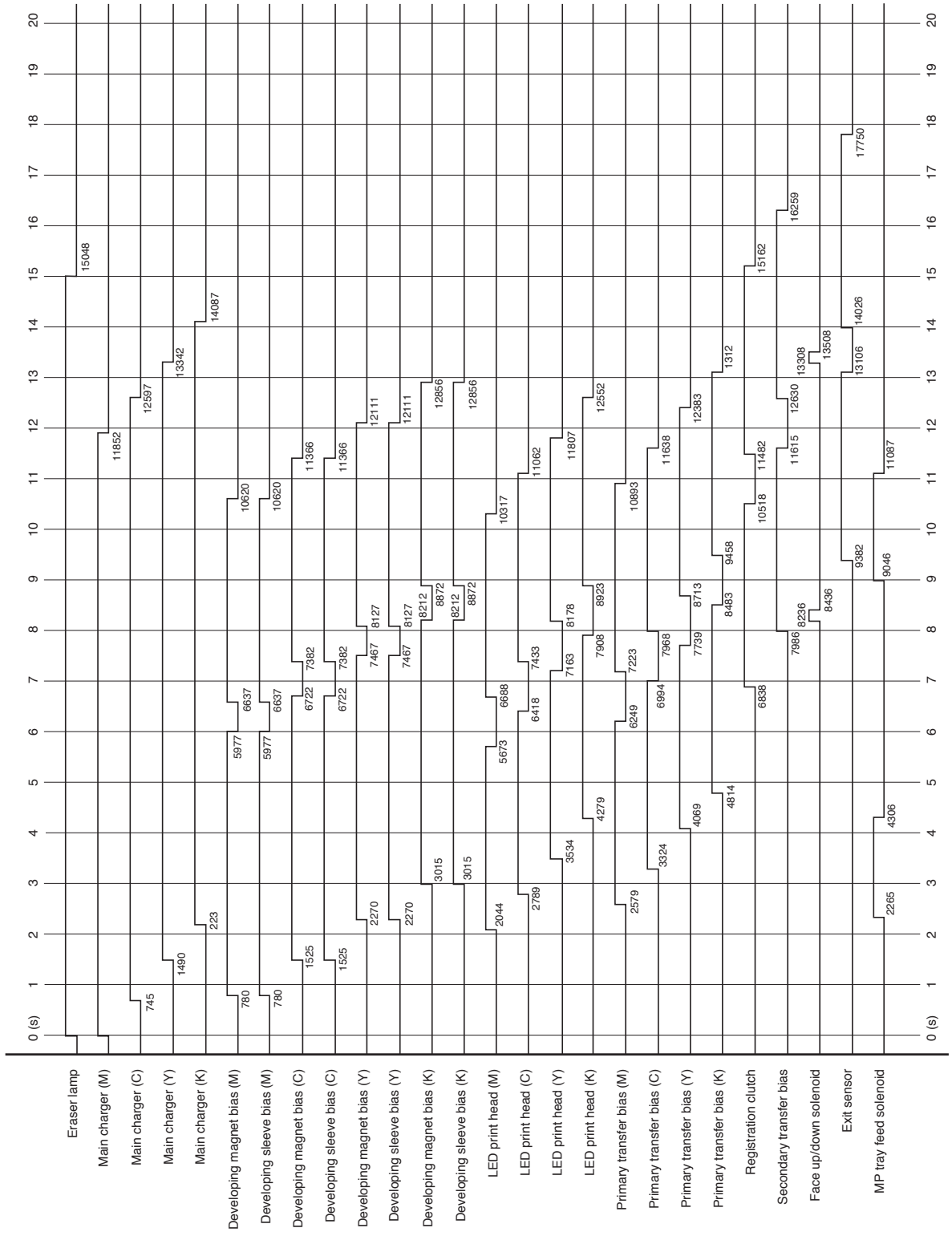
(3) Timing chart No. 3 Paper cassette, Letter size



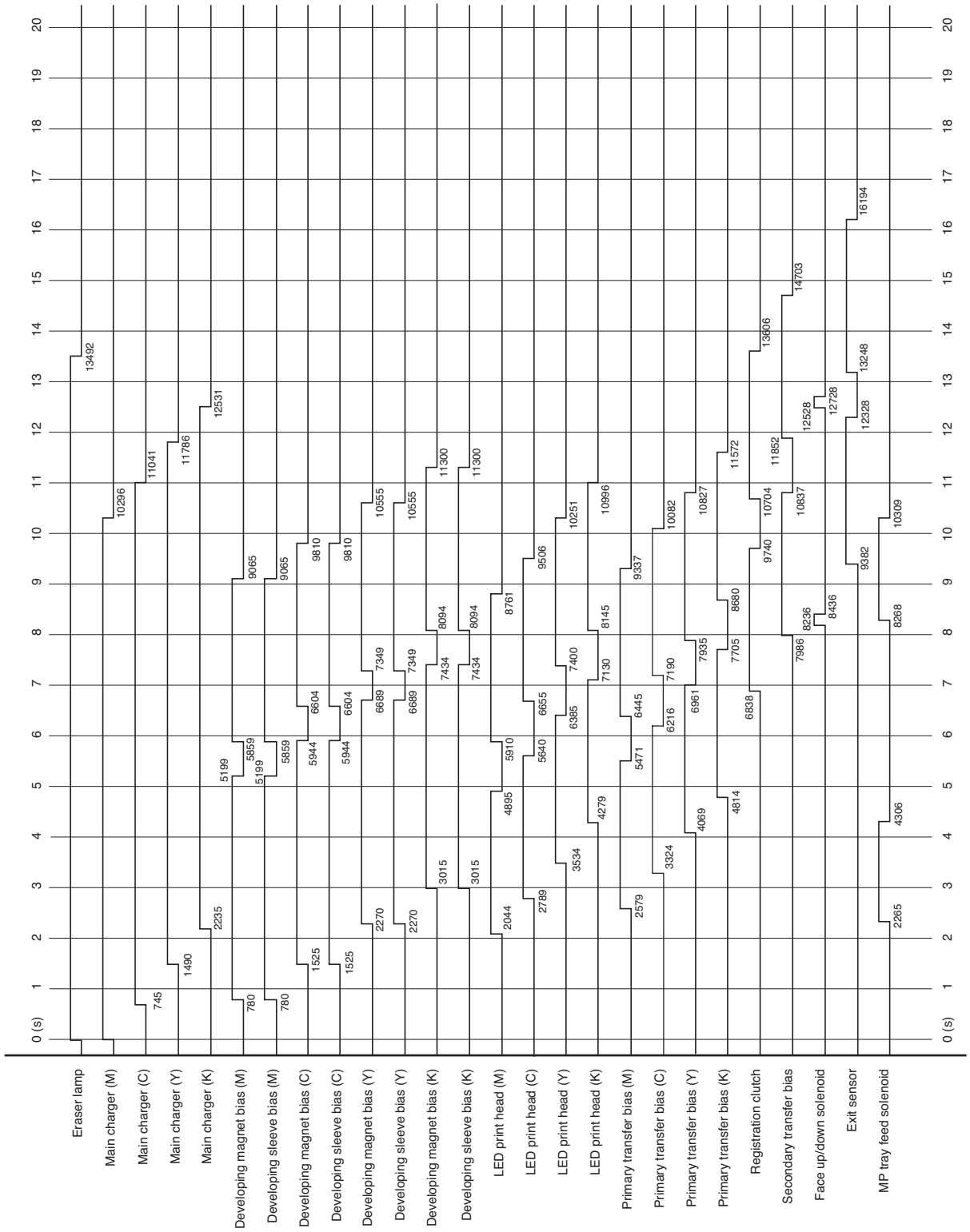
(4) Timing chart No. 4 MP tray, A4 size



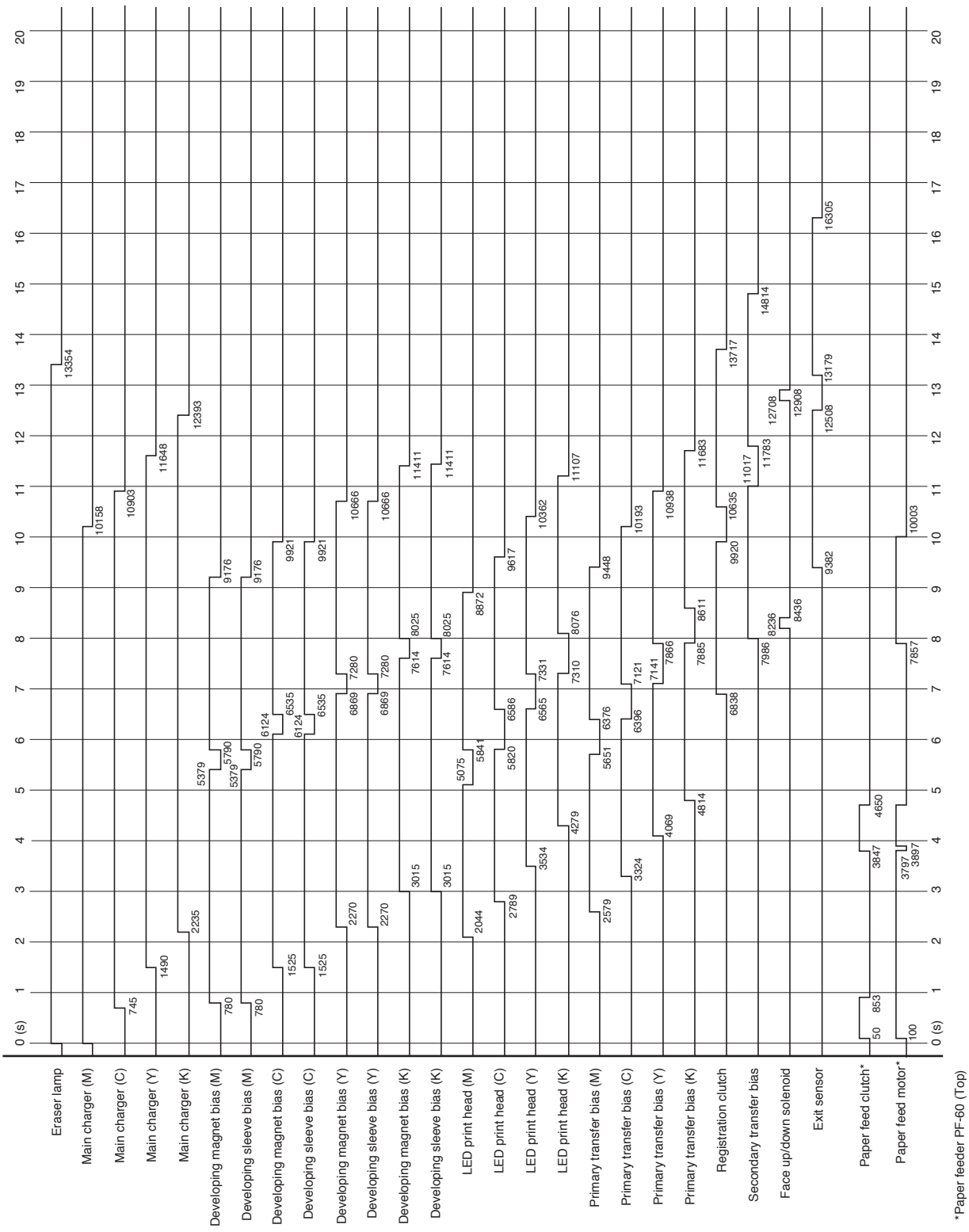
(5) Timing chart No. 5 MP tray, Legal size



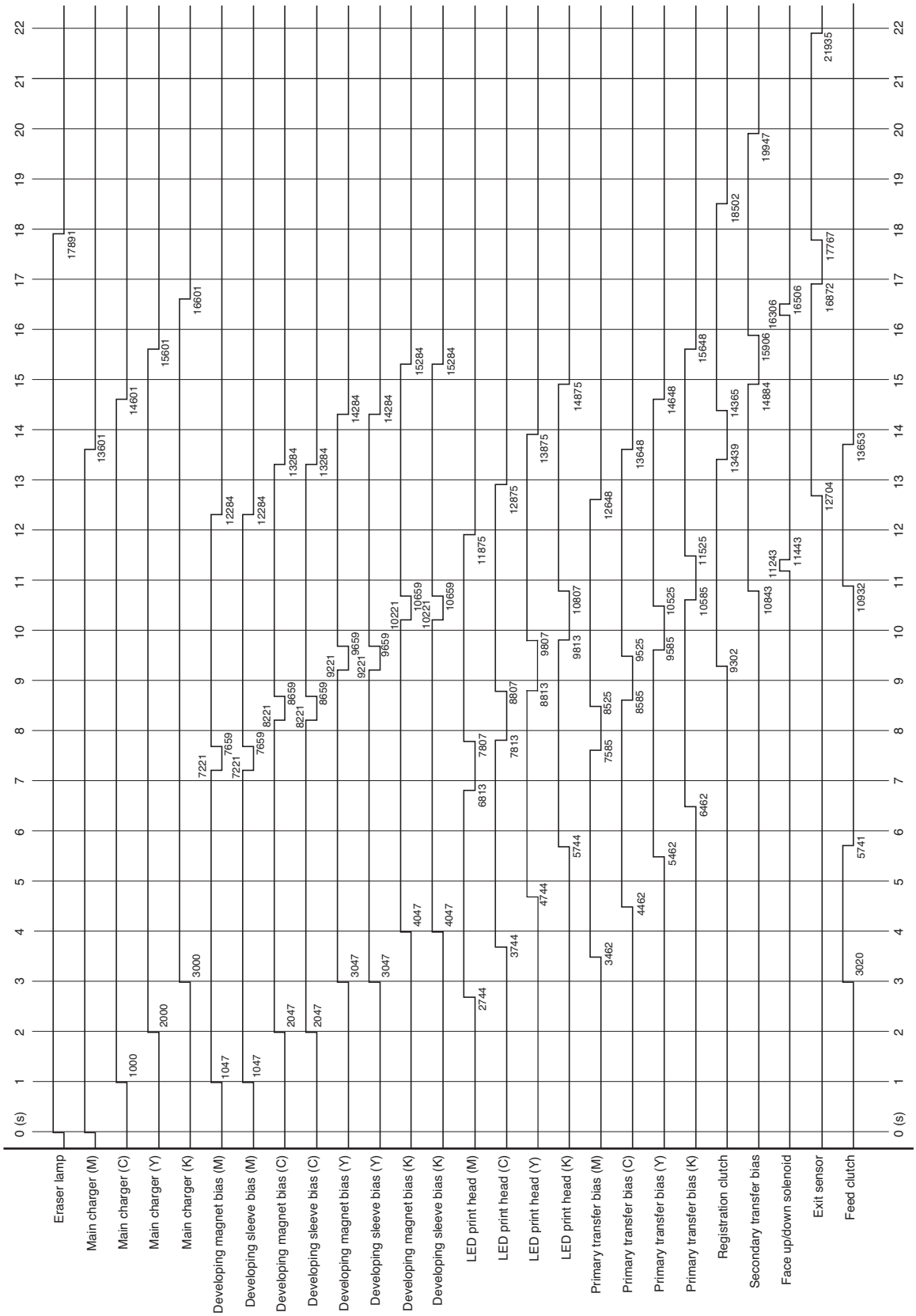
(6) Timing chart No. 6 MP tray, Letter size



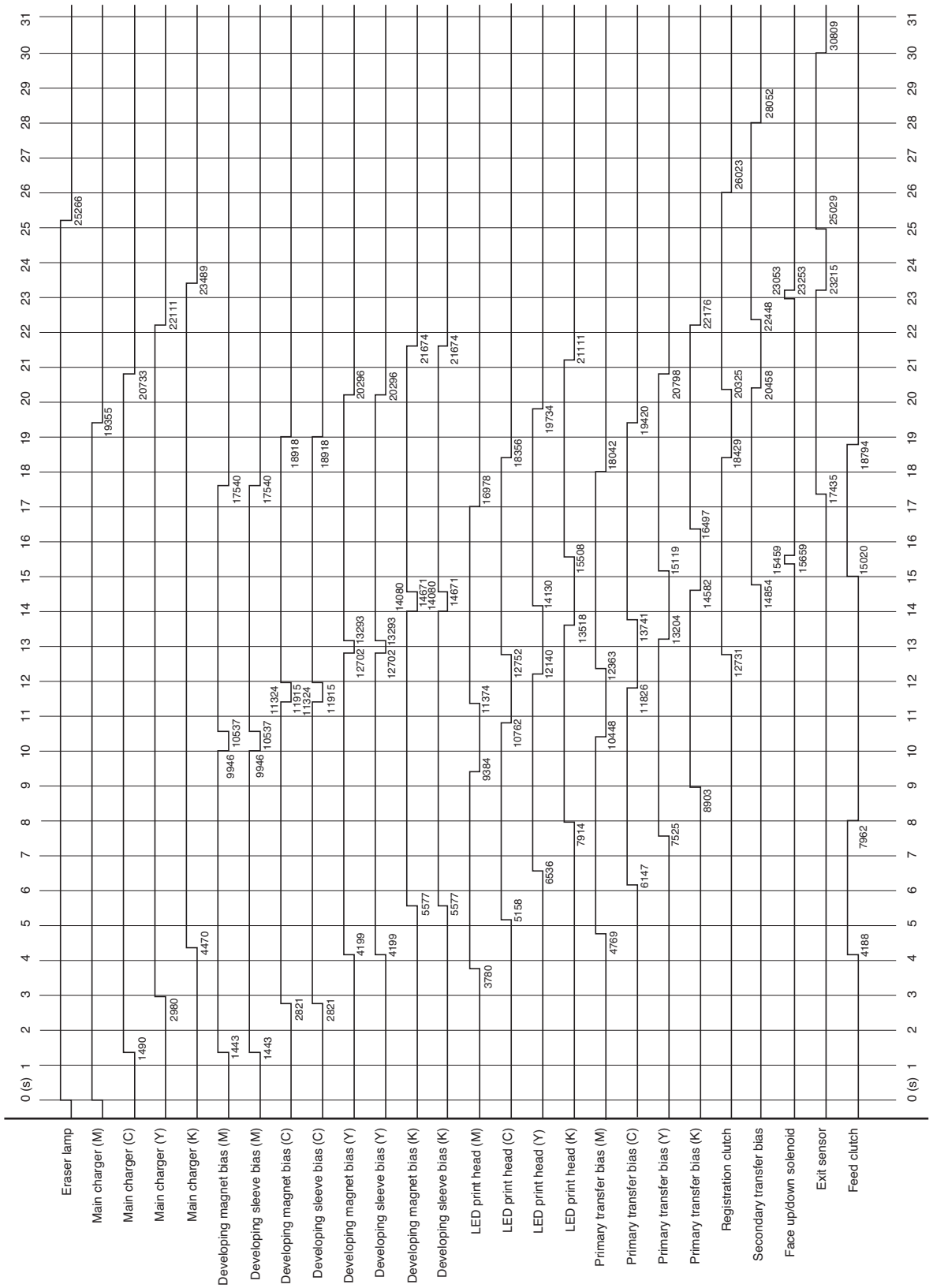
(7) Timing chart No. 7 Optional paper feeder, A4 size



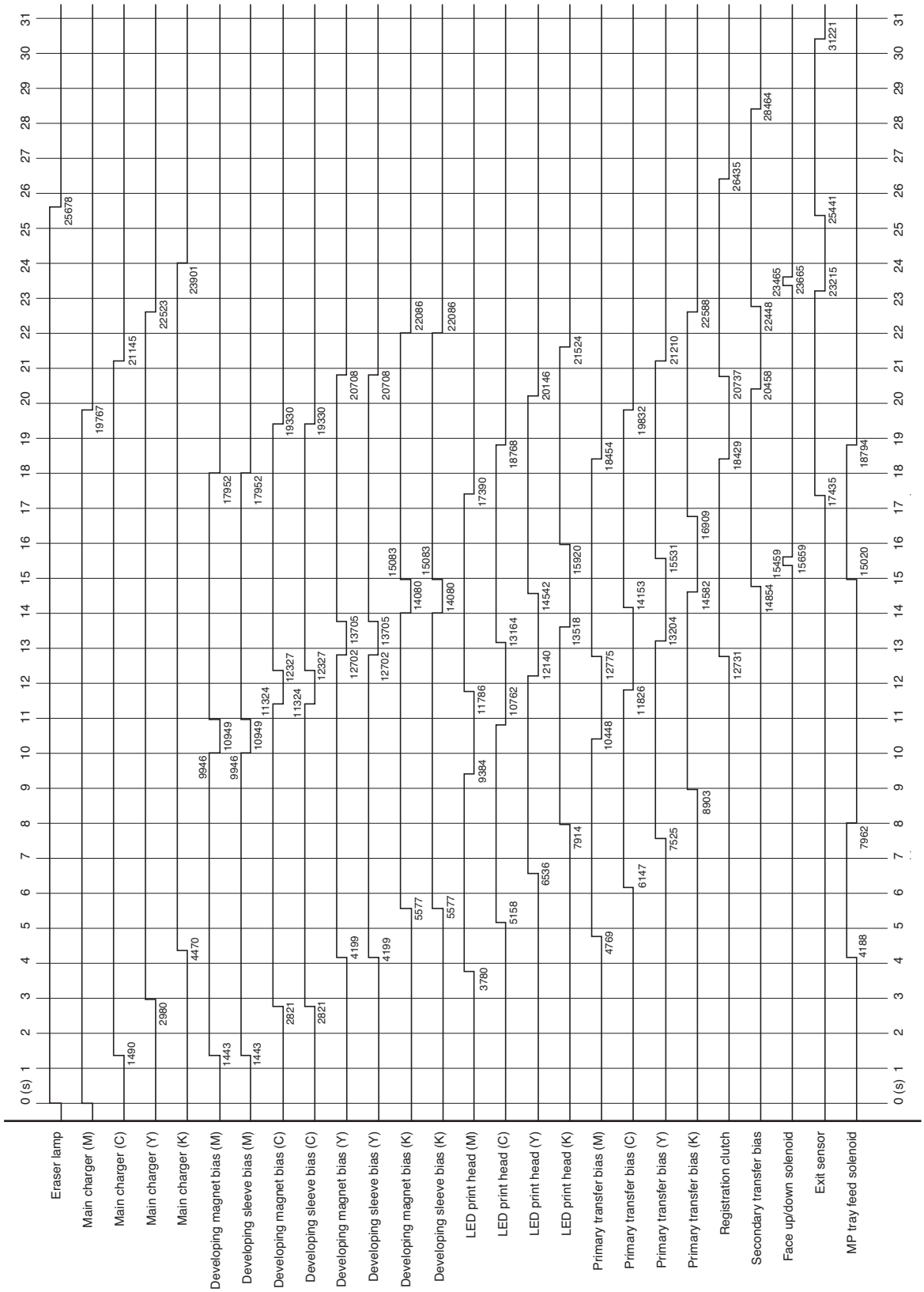
(8) Timing chart No. 8 Paper cassette, A4 size, Slow mode 1 [75 %]



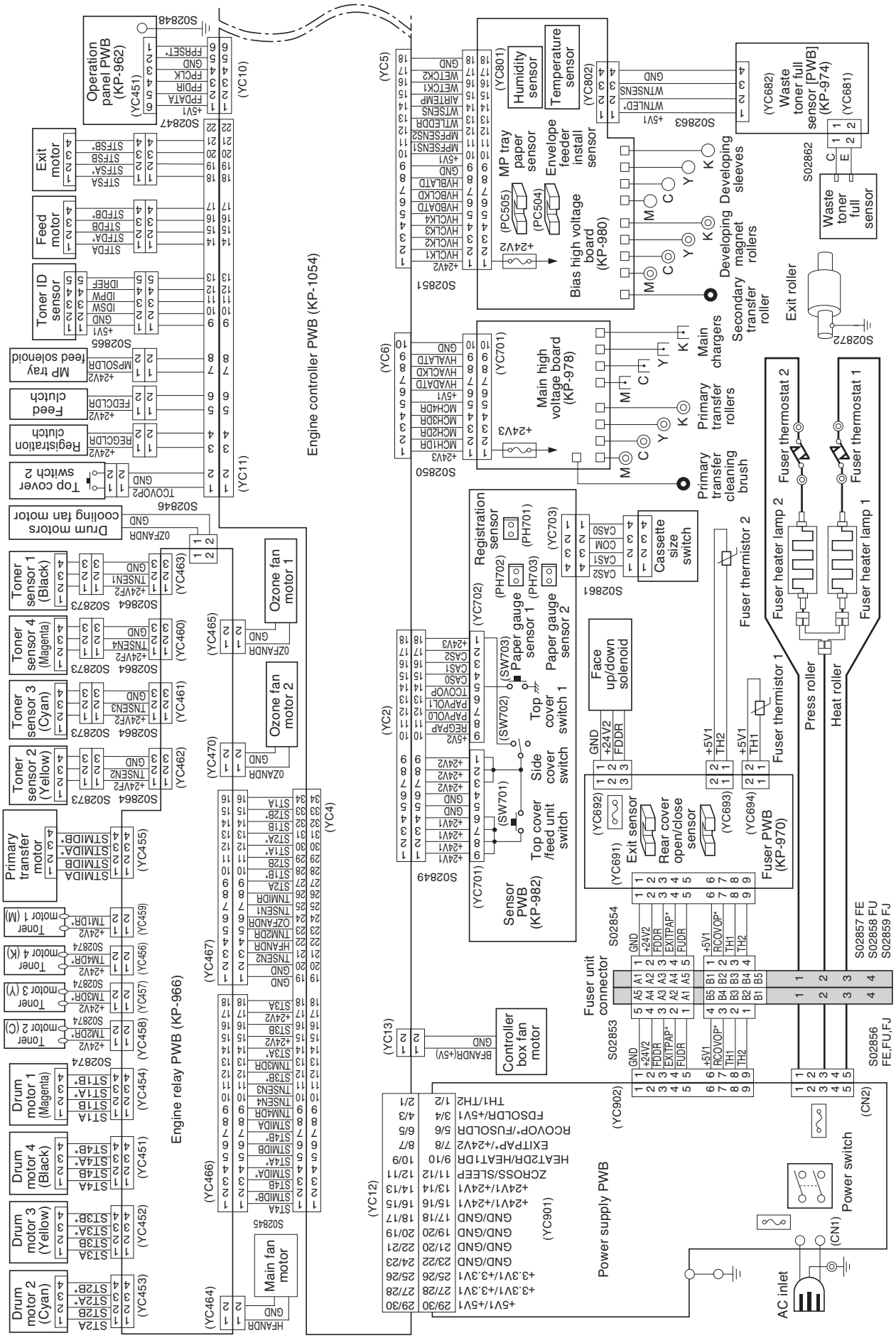
(9) Timing chart No. 9 Paper cassette, A4 size, Slow mode 2 [55 %]

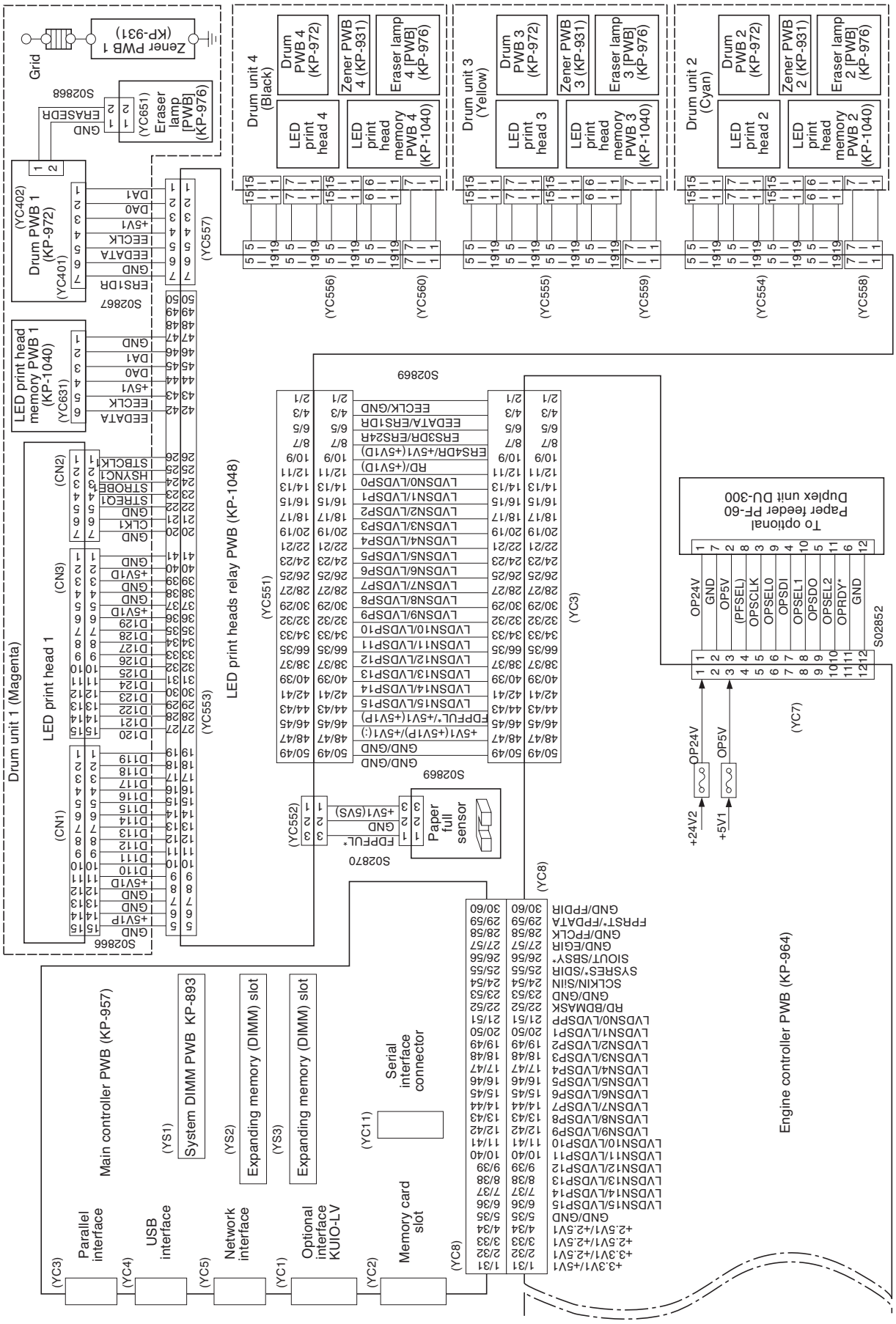


(10) Timing chart No. 10 MP tray, Transparency

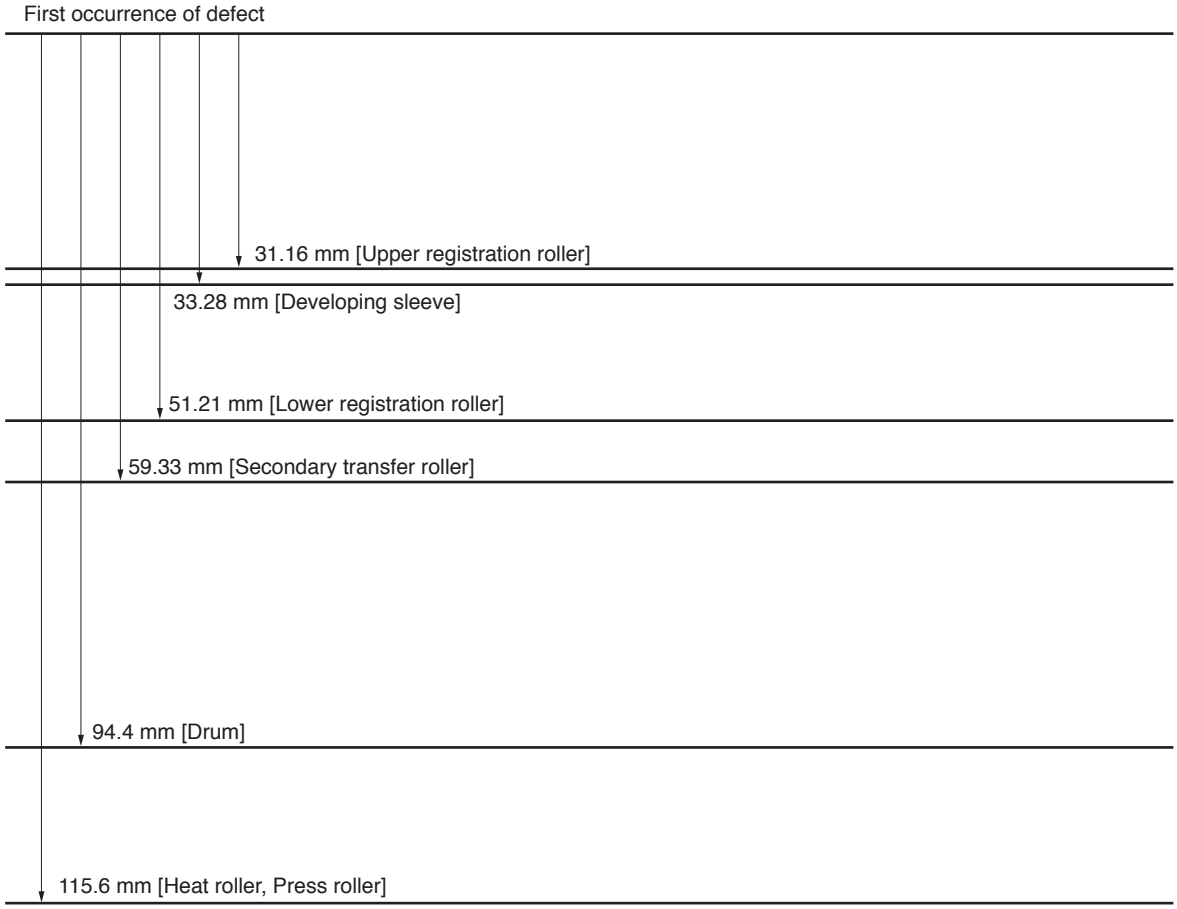


(11) Wiring diagram




Engine controller PWB (KP-964)
Main controller PWB (KP-957)
Parallel interface
USB interface
Network interface
Optional interface KUIO-LV
Memory card slot
Serial interface connector
System DIMM PWB KP-893
Expanding memory (DIMM) slot
Expanding memory (DIMM) slot
Drum unit 1 (Magenta)
LED print head 1
LED print head memory PWB 1 (KP-1040)
Drum PWB 1 (KP-972)
LED print heads relay PWB (KP-1048)
Drum unit 4 (Black)
Drum unit 3 (Yellow)
Drum unit 2 (Cyan)
Drum PWB 4 (KP-972)
Zener PWB 4 (KP-931)
Eraser lamp 4 [PWB] (KP-976)
LED print head 4
LED print head memory PWB 4 (KP-1040)
Drum PWB 3 (KP-972)
Zener PWB 3 (KP-931)
Eraser lamp 3 [PWB] (KP-976)
LED print head 3
LED print head memory PWB 3 (KP-1040)
Drum PWB 2 (KP-972)
Zener PWB 2 (KP-931)
Eraser lamp 2 [PWB] (KP-976)
LED print head 2
LED print head memory PWB 2 (KP-1040)
Zener PWB 1 (KP-931)
Eraser lamp [PWB] (KP-976)
Paper full sensor
To optional Paper feeder PF-60 Duplex unit DU-300
+24V2
+5V1
OP24V
OP5V
S02866
S02867
S02868
S02869
S02870
S02852

(12) Repetitive defects gauge


First occurrence of defect
31.16 mm [Upper registration roller]
33.28 mm [Developing sleeve]
51.21 mm [Lower registration roller]
59.33 mm [Secondary transfer roller]
94.4 mm [Drum]
115.6 mm [Heat roller, Press roller]